

# COAL AGE

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No. 29

So far as unionism in coal mining is concerned, Illinois is the star performer of all states in this country. Last year, in compliance with the check-off system in force in that commonwealth, coal operators paid more than \$650,000 into the treasury of the mine workers. Practically every one of the 70,000 colliery employees in Illinois is a member of the union. In the anthracite field, where the "check-off" has not been forced on the operators, a recent report of the U. M. W. of A. showed an enrollment of only 14,000 out of 170,000 hard-coal miners.

It is evident therefore, why the leaders of united labor desire anthracite recognition, such as would be conceded in the proposed check-off system. The difference to them is a matter of increasing their annual income in the hard-coal regions from \$130,000 to more than a million and a half. What could they not eventually accomplish if provided such a sum to work with?

The anthracite operators have the Illinois mine owners set before them as an example of what will happen when labor gets the upper hand. Conditions in Illinois have become such that John Walker and his lieutenants practically dictate the policy of the industry in that state. Men cannot be discharged, machinery introduced, nor improved methods inaugurated unless the act is labeled with a union endorsement.

Illinois has 850 mines, operated by 260 companies, and it is this condition that has brought about a policy of "every man for himself, and the devil take the hindmost." As a result, mine owners have lacked unity of purpose, and coal mining in that state has been brought to a deplorable pass. The union is adding to the present burden of the operators little by little, not seeming to realize that by hampering and weakening the employer, the laborer himself will fail to prosper. With highest wages and most favorable working conditions, the Illinois miners receive less per year than do coal hewers in many other fields where the rights and welfare of the men are supposed to be less properly safeguarded.

Unlimited success, therefore, is the danger rock on which the miners' organization and the labor movement as a whole will dash itself to pieces. Human nature is very much the same in the average of mankind. Just as the good swimmer, glorying in his superb strength and skill, goes furthest from shore and perishes through overestimating his own power,

so capitalism through the abuse and misapplication of wealth became top-heavy and tumbled from its apparently safe foundation. In like manner, labor unions are piling success on success, using each victory as a stepping-stone to a new demand, until at last the structure built with so much pride and hope will collapse because the architects bungled the plans and ignored the necessity of observing established economic facts.

No matter what color glasses we look through, everyone must recognize that wages cannot be larger than the product of a man's labor; in fact, they must always be less than the product—big enough to give the capitalist his due returns and the employer his living profits. When workmen, acting individually or collectively, attempt by force to refute this certain principle of wages, the result can be no more successful than would be an effort to overthrow the law of gravity.

Production will ever be the only true measure of a workman's pay, and in accord with this idea, the wages-class are entitled to the immediate benefit of every improvement in science and art, every discovery of resources in nature, and every advance in their own industrial character. However, the doctrine of *Laissez faire*, which teaches that the spontaneous action of individuals, each seeking his own interest on his own instance, will attain the best results, is mischievous, and only applicable in special cases. Acceptance of such a principle is certain to bar the way to advances in the industrial condition of mankind; in brief, such a rule, like fire or water, is a good servant but a bad master.

In conclusion, therefore, we uphold the unionization of workingmen when they combine to prevent industrial degradation, and to better their condition in life, but we deprecate the unwise exercise of great power, such as caused the head of a powerful labor organization to declare in New York this week, that unless the demands of his union be granted, he would shut off the food supply of our greatest city in less than seven days. If labor leaders could only discern that the chief danger to their cause lies in the errors of their own ways, the future of the wage earner would be brighter and safer than it is today.

*Continuing this line of thought, next week we shall deal with compulsory arbitration, and the recent advances made by workingmen in New Zealand, the world's social experimental ground.*

# The Sheridan, Wyo., Coal Field

THE CARNEY COAL CO.

The property of the Carney Coal Co. is on the northerly side of Tongue River, embracing 2600 acres of patented land owned by the company and 640 acres of leased land. The Carney bed, as it is locally known, has been developed here to the greatest extent of any point in the district. The mine is opened by two drifts in the river bluffs, about a quarter of a mile apart. The surface plant is one of the most complete in the Sheridan field, comprising two tipple, one of which is of steel and concrete throughout; the other tippie is of frame construction and well equipped. The coal is worked by undercutting with electric chain machines, and broken down to a shale parting which gives a thickness of approximately 10 ft. of clean coal. The plant has a maximum ca-

By Jesse Simmons \*

This is the second and concluding article describing operations in this field. The Carney Coal Co., one of the properties dealt with, has a mine with a capacity of 4000 tons per 8-hour shift. A detailed account of the Acme Coal Co.'s plant will follow at an early date.

\*Deadwood, S. D.

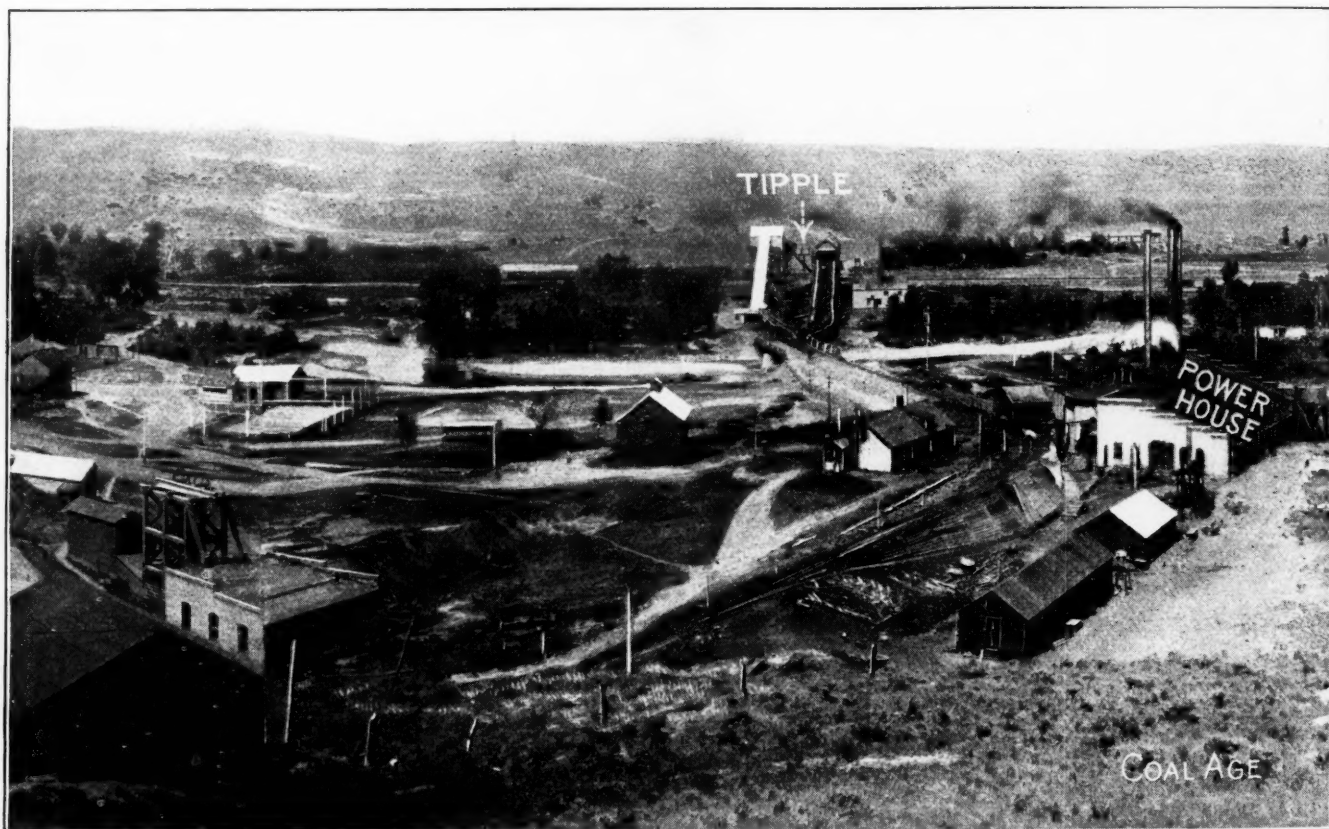
ning water from a system maintained at the power plant. C. B. Seymour, Carneyville, Wyo., is general manager.

THE KOOI MINE.

Peter Kooi, of Kooi, Wyo., is the owner and manager of the property bearing his name, near the western extremity

main parting, from whence a tail-rope haulage system is used to transport it to the tippie. From the pit mouth inward for a distance of 150 ft. the pitch is 4%, and from that point the entry follows the seam on a pitch of about 1.5%. The tail-rope haul is 1500 ft. in length, with a Flory engine for furnishing the power.

A Norwalk 24x24-in. compound, 2-stage, air compressor furnishes air for the 7 Harrison punchers which are used for undercutting the coal. Some modifications are now being made, following the adoption of electric power secured from the Sheridan Electric Light & Power Co. The mine has a capacity of 2000 tons per day during the winter, and Mr. Kooi is proud of the fact that he has done this with a total of 102 mine cars.



SURFACE EQUIPMENT AT THE MONARCH MINE, IN THE SHERIDAN DISTRICT

capacity of 4000 tons in an 8-hour day. The mine is worked in 30-room panels, rooms being driven on 45-ft. centers to a length of 300 ft.; electric haulage is used.

The camp, known as Carneyville, includes 163 houses, which were constructed by the company, and are leased to the employees at a nominal rental, a church, store, office building, etc. Every room in the village has electric lights, and every home is supplied with run-

of the Sheridan field, on the southerly side of the Tongue River, two miles west of the Monarch mine. The Monarch seam is mined, the bed showing practically the same thickness as in the Monarch property, which has been described, and the coal is mined on the same system.

Horses haul the coal from the rooms to the sub-partings, and a Westinghouse 6-ton electric-locomotive takes it to the

THE MODEL COAL CO.

Between the Acme and Carney mines, the Model Coal Co. is opening and equipping a new property on the Carney seam, the only shaft mine in this portion of the district. The opening is made by a shaft 12x24ft. and 123 ft. deep. The shaft is timbered with 12x12-in. and 10x10-in. square timbers, backed by 4-in. lagging. In addition a sump 12 ft.



in depth has been put down below the coal.

An electric hoist of 100 hp. using alternating current at 440 volts, will be used to hoist the coal. A 12-ft. Guibal fan, operated by a 35-hp. alternating current motor, will furnish air. Electric, shortwall, chain machines will be used

for undercutting. Mine water will be handled with a motor-driven pump. A re-screening plant will be erected to prepare the smaller sizes of coal, and trackage, scales, etc., for handling 1000 tons per 8-hour day are being installed. The transformer house will contain transformers for stepping the power

down from the line voltage to 440 volts, and a 1000-kw. motor-generator set, developing a 250-volt current for the mining machines, etc. Power is purchased from the Sheridan Electric Light & Power Company.

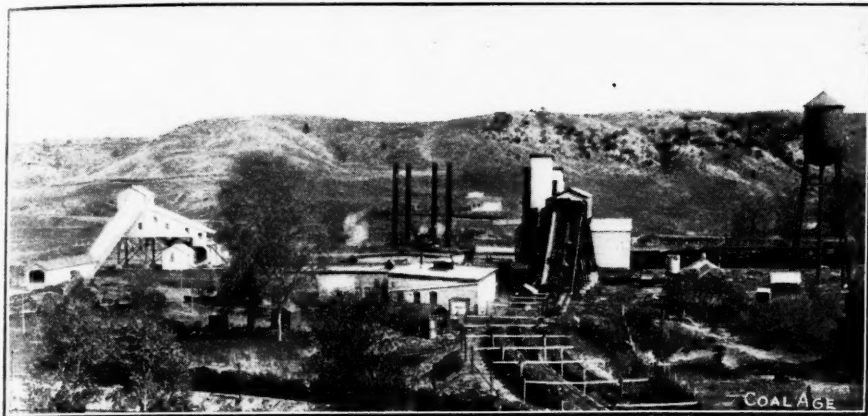
The Model Coal Co. is incorporated under the laws of the state of Wyoming. The property is leased under a royalty per ton of coal extracted. The president is Frank W. Smith, Detroit, Mich.; treasurer, John Peters, Williamsport, Penn.; general manager, Stewart Kennedy, Carneyville, Wyo.

#### THE ACME COAL CO.

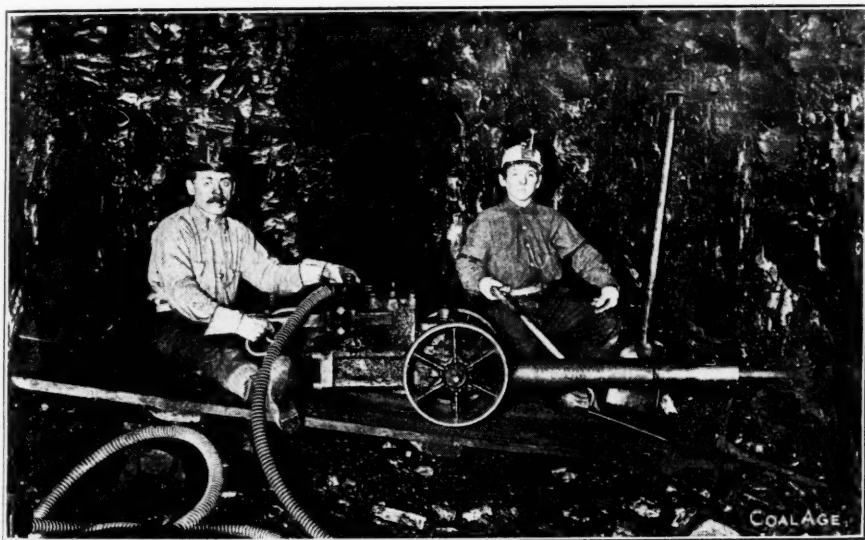
The Acme Coal Co. operates two properties, the Nos. 1 and 2 openings, which are on a tract of land near the western edge of the field, and the No. 3 opening, which is at the present time the most northeasterly development in the district; the properties are about three miles apart. Nos. 1 and 2 are operating in the Carney seam, and the No. 3 workings are in the Monarch. No. 3 is a new property, and a splendid plant is being rapidly completed and put in shape to make an excellent grade of coal for years to come, while the ultimate end of operations at Nos. 1 and 2 can be but a few years distant.

No. 3 is a drift mine, the entry being made in the northerly bluffs of the Tongue River. The coal is mined by undercutting with Jeffrey mining machines, of both breast and longwall types, operated by 250-volt direct current. The coal is hauled from the main partings to the yards, which are a quarter of a mile from the pit mouth, by Jeffrey electric-locomotives. Here the cars are picked up by a cable-haul and delivered to a second cable-haul which takes them up an incline approach to the top of the tippie, 49 ft. above the yard tracks, where they are dumped in a crossover dump.

The coal, dumped from the mine cars, enters a bin with a movable bottom, by



SURFACE PLANT OF THE CARNEY COAL CO.



PUNCHER AIR MACHINE IN THE KOOI MINE



VIEW OF TOWN AND MINE AT CARNEYVILLE, WYO.

which it is fed to a shaker-screen of 3000 tons per 8-hour day, capacity. This screen has both lateral and longitudinal motion—something new to the Sheridan district—and makes a very clean product. From this screen coal may be loaded into either open- or box-cars, an Ottumwa loader being used for loading the latter. Covering the screen with steel plates makes it possible to dump mine-run.

The screen has 6-in. circular openings and the product passing over it is the standard lump of the Sheridan district. That portion passing through is either loaded into open cars or carried on a 30-in. belt-conveyor to the re-screening plant. This plant contains a revolving screen 24 ft. long and 6 ft. in diameter. For one-half of this length it is sur-

rounded by a section 7 ft. in diameter. The screen openings are as follows, reckoned from the upper end: 1-in. for the first 12 ft.; 2-in., for 6 ft., and 3½-in. for the remaining 6 ft. The 12-ft. section of outer screen surrounds the inner section of equal length having 1-in. apertures, and has ½-in. openings. The screen is approximately 65 ft. above the ground, and underneath are bins with a capacity of 500 tons. On this screen are made slack, pea, nut and egg. The latter product is the portion coming from the main tippie which passes over the largest openings in the revolving screen. The entire tippie and re-screening plant is operated by electric motors.

Power is secured from the Sheridan Electric Light & Power Co. whose plant is a few rods away from the tippie. This

plant is equipped with 3 Heine water-tube boilers having Roney stokers, and 2 Westinghouse Parsons turbines, each of 1250 kw. capacity generating a 2300-volt, 60-cycle, 3-phase, alternating current. The current is stepped up to 22,000 volts for transmission to the city of Sheridan and surrounding mines.

The product from Nos. 1 and 2 mines is dumped over a frame tippie, situated convenient to both openings; both are drift mines. Electric undercutting and electric haulage are used. The plant has a capacity of 1000 tons in 8 hours. Here, also, a well built camp has sprung up to afford accomodation for the employees. A. K. Craig and Ora Darnall are the owners of the capital stock of the Acme Coal Co., both making their headquarters at Acme, Wyoming.

## Mine Registration and Checking

At the mines of the International Coal & Coke Co., at Coleman, Alta., Canada, all the underground men are hired by one person, who, on engaging a man, gives him a slip, directed to the timekeeper, showing his name, occupation and the time at which he is to start work. The timekeeper then registers the new employee in the "Mine Register," which is required to be kept in accordance with the Canadian coal mines act. The register at this particular mine is in the form of a loose-leaf ledger, allowing a leaf to each man. When the leaf is filled in, it is inserted in the binder alphabetically. This record is of the form shown in Fig. 1.

If the workman can write, he is required to sign the form himself and the balance is filled in by the timekeeper. The record is almost self-explanatory. "Dependents" and "Dependents' Address" are recorded for convenience in case of serious accidents and for information required in connection with the workman's compensation act, which is in force in Alberta.

The employee is next given an aluminum check with a number on it, called the "identification number." He is instructed to carry this check at all times and is told that it will be necessary for him to present it on pay-day before receiving his pay, and to return it on leaving the employ of the company; also that if lost he will be held responsible for it.

When the man leaves the employ of the company, the date of his time slip is marked on the register and the leaf is removed to a separate binder, kept for that purpose. If, at any time, the man should be rehired, the leaf is again inserted in the "mine register," and, if possible, the same "identification number" is given him, the date of reemployment being marked on the leaf.

By W. A. Davidson \*

At the Coleman mine of the International Coal & Coke Co., a loose-leaf record is kept of all employees, past and present, and a most satisfactory system of checking the men in and out of the mines has been installed. The registration and checking systems, the check board, and methods of operation are here described in detail.

\*Superintendent and mine manager, International Coal & Coke Co., Coleman, Alta.

The identification numbers are given out in rotation, and are assigned to the outside men as well as those working inside, but the "pegging-in" board or check board is used only for the inside men. If

FIG. 1. LEAF FROM MINE REGISTER  
EMPLOYEES' REGISTER

Date .....	Identification No. ....
Name .....	Signature .....
Age .....	
Nationality .....	
Married or single .....	
Dependents .....	
Dependents' address .....	
Occupation .....	
Mine No. or seam .....	
Where last employed .....	
Previous experience .....	
Date of time check .....	
Re-hired .....	
Remarks:	

a "company man," the new employee also is given a brass check with a number, called the "company number."

### CHECKING SYSTEM

In this province, a law, commonly called the eight-hour law, is in force. This limits the hours of work underground to eight hours and makes it compulsory to keep a register showing the times of ascent and descent of each shift. It is essential, therefore, to have some good reliable checking system that will show at all times the number of men in the mine and will record at the completion of a shift the number of men, if any, left in the workings. A system of this kind is of great value, especially in the case of serious accidents, when there is so much confusion and when reliable information is so essential. The form of record in use at the Coleman mine is shown in Fig. 2.

The check board, on which is kept a record of the men at work, is made of 1-in. kiln-dried pine, free from all knots or blemishes and straight grained. The accompanying illustration, Fig. 3, shows a part of the board used at Coleman and is almost self-explanatory, but in order to make it as clear as possible a description may be given as follows:

The left side of the board is devoted to keeping track of the No. 2 Seam contract miners. The contracts are numbered from 1 to 60, and opposite each number

FIG. 2. THE "EIGHT HOUR" REGISTER

DATE	Time at Which Shift Com- menced to be Admitted to Mine	Time at Which Shift Com- menced to Return from Mine	NAME	Hours Worked in Excess of Time Fixed by Act	Cause of Time Being Worked in Excess of That Fixed by Act	REMARKS	SIGNATURE



Each hole on this side of the board is given a number (company number). The No. 2 men are all given numbers beginning with 2, and the No. 4 men, numbers beginning with 4. This gives ample room for expansion, 1000 numbers for each seam thus being available. A piece of cardboard, bearing the names of the men, is slipped through staples above the holes in the manner previously noted. The number on the board corresponds to the number on the company check, which is given to a man when he registers.

Some of the advantages of this checking board are as follows: When the shift has passed, going out, if any pegs are left in the check board, it becomes known immediately that someone is still in the mine, and the board tells who it is and where he was working. Similarly, when the shift is going on, the board at once shows the absentees and their working places, which can be filled from the "open links." The working time is transferred directly from the board to the books. All surface men who go into the mine temporarily to do repair work, have their names placed on the board and are

FIG. 4. UNDERGROUND OPERATIONS

MEN

required to check in and out in the same way as underground men, so, as stated before, the board shows at all times the men actually below ground.

In addition to booking the time, a daily record is kept of each shift, showing the number of men employed. This is obtained by simply counting the pegs on the board after the shift has passed, and the result is entered on the form shown in Fig. 4. The classification of labor on this sheet is the same as on the board. Such a record is of immense value to the mine manager, as can be understood without further explanation.

#### KEEPING TRACK OF SEVERAL SHIFTS

When two shifts overlap, as in the case of one shift starting at 7 o'clock and an-

other at 9 o'clock, a different style of peg is used for each shift. In this particular case it has been found necessary to use only two kinds of pegs. The common brattice nail, along with the ordinary 3-in. spike, cut off somewhat, serve the purpose well enough. The 3-in. spike, being a little brighter and slightly longer than the brattice nail, makes the distinction quite evident. For conditions more complicated, different colored pegs could be used.

A person standing centrally in front of the board can easily reach all parts of it, and the pegs can be worked quickly, as are the keys of an instrument, so that if all the men of a shift follow one another closely, the board can be cleared accurately in two minutes.

At this mine there are two checking-in stations, No. 1 and No. 2. No. 1 is the main station. Exactly the same system is followed at Station No. 2 as at No. 1, but the board is not quite so large, because the board at No. 1 includes the record for No. 2. After the men check in at No. 2, the result is telephoned to No. 1 and their pegs are also put in No. 1 board. At the end of the shift, No. 1 station is informed whether or not No. 2 is clear, so that the board at Station No. 1 covers the whole mine and shows at all times the total number of men below ground. This system has been found to be entirely satisfactory, and there is no reason why any number of stations could not be worked in the same way—each reporting to No. 1.

## The Jamison Coke Plants, Greensburg

By R. Dawson Hall

The subject of the utilization of the waste gas from coke ovens has been so much discussed and yet so little comparatively has arisen from the discussion that it is thought that the following article may be of value to those who still retain the old bee-hive oven methods. There is no question but that the waste-heat boiler has come to stay wherever coke is made in bee-hive ovens and the problem is now what is to be done with the excess heat after all the needs of the colliery as regards power production are provided.

Those who have studied the use of waste heat are convinced that the logic of the situation favors the installation of means to utilize it at least to a degree sufficient to meet the full demands of the colliery where the coke is made. The sale of excess power is a larger question. It is to be hoped that some means may be found enabling the operator to sell this power, which costs him nothing except a comparatively small initial outlay.

#### JAMISON PLANTS

The Jamison Coal and Coke Co., John M. Jamison, president, and W. W. Jamison, vice-president, at their Greensburg operations, mine approximately 2,500,000 tons per annum. They also have large interests in West Virginia, but the matter of this article is confined to a consideration of three coke-oven plants of the following names, locations and equipments: No. 1 at Luxor with 401 ovens, No. 2 at Hannastown with 516 ovens and No. 4 at Crabtree with 492 ovens, a total of 1409 ovens. The coal mined is the Pittsburgh and runs from 7 ft. 6 in. to 8 ft. thick in this section.

When the coal comes from the mines, all which passes through a 4-in. screen is shipped. The balance is washed after crushing and made into coke, the analyses of the materials at the various stages being as follows:

These plants make only 72- and 96-hour coke. Ovens are now supplying waste gas to two boiler plants. Over 20 horsepower is supplied by each oven and no coal is fed to the boilers even on Mondays. The coke made by the waste-gas ovens is superior to the ordinary bee-hive coke, being free from black butts and a trifle lower in sulphur.

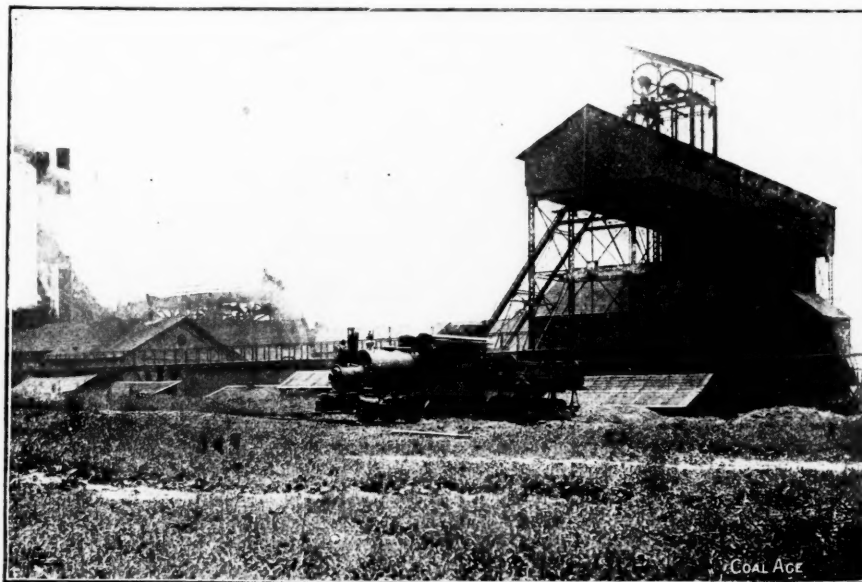
#### ANALYSES OF COAL AND COKE JAMISON PLANTS

	Ash	Sulphur	Moisture	Volatiles	Fixed Carbon
Screened coal...	7.45	1.28	0.70	32.95	58.90
Washer slack...	10.00	1.40			
Washed coal...	7.50	1.10			
Coke...	9.80	0.88	0.16	1.00	89.04

It may be noted, though it is a trite observation, that the slack, which at these plants goes to the washer, is not as good as the coal which is shipped to market. This is always the case, the bulk of the impurities being found in the disintegrated coal.

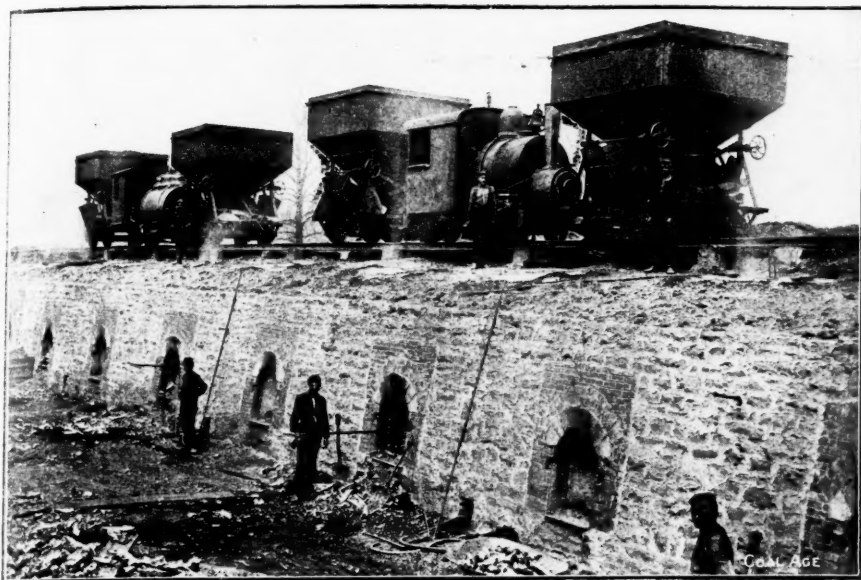
The slack is washed in Stein-Boericke and Luhrig jigs and the cleansed product is discharged into one of two large tanks. These tanks at plant No. 2 are of iron, lined with brickwork, the joints being filled with cement. At the other plants they are of reinforced concrete. They are filled on alternate days. Elevators remove the slack from one tank at a time and empty it into bins for charging into larries.

By this means the washed coal is rendered comparatively dry before charging. This drying not only avoids an important waste of heat, but practically extends the coking period one hour and as it results in the heat of adjacent ovens not being



JAMISON MINE NO. 2 HANNASTOWN, PENN.





A ROW OF OVENS AT JAMISON MINE NO. 2

absorbed unduly by ovens newly charged, it provides for an oven temperature suitable for the manufacture of the strongest and densest coke. It is probable that some sulphur leaves the coal during the interval of storage, because the water drawn off is quite strongly impregnated with sulphuric acid. The pyrites can be entirely robbed of its sulphur by oxidation and solution, whereas the heat of the oven can only drive off 50 per cent. of it. Consequently it would seem that a leaching process, which is not carried far enough to destroy the coking power of the coal, should be advantageous. I have not seen any data on the subject, but it would appear to be a fertile field for investigation. The generalized symbol for pyrites is  $\text{FeS}_{n+1}$  and that symbol still remains applicable after heating the mineral. The factor  $n$ , however, progressively becomes so great that it practically equals  $n+1$  and  $\text{FeS}_n$  after being strongly heated, becomes  $\text{FeS}$ .

#### FOUNDRY COKE

The Jamison plants aim to make nothing but foundry coke. Instead of charging each oven every alternate day except Sundays and drawing furnace coke four days in the week and foundry coke on Mondays and Tuesdays, each oven is charged but once in three days, and if Sunday intervenes the coal remains in the oven four days. So all the ovens are producing either 72- or 96-hour coke. Three grades are made, A, B and C, the first, A, is No. 1 foundry, B is No. 2 foundry and C is furnace coke. There is a large amount of the product sold on a guarantee that the sulphur content shall be less than 0.90 per cent.

The following are the input and output of 72- and 96-hour charges:

#### CHARGE AND OUTPUT OF COKE OVENS

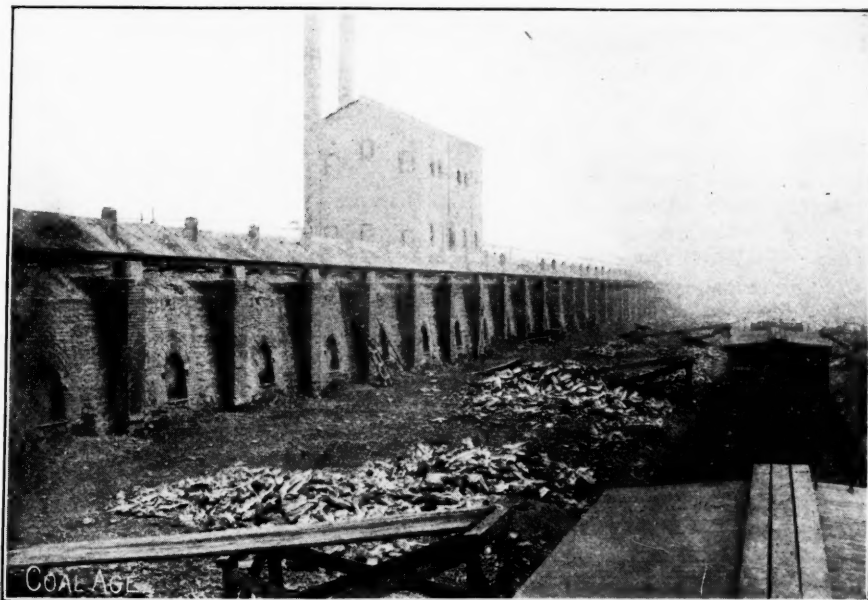
Material	72-HOUR CHARGE		
	Pounds	Per Cent. of Charge	Per Cent. of Output
Washed coal.....	15,680	100.00	132.09
Good foundry coke.....	9,528	60.76	80.27
Culls.....	1,706	10.88	14.37
Breeze.....	636	4.06	5.36
Total output.....	11,870	75.70	100.00

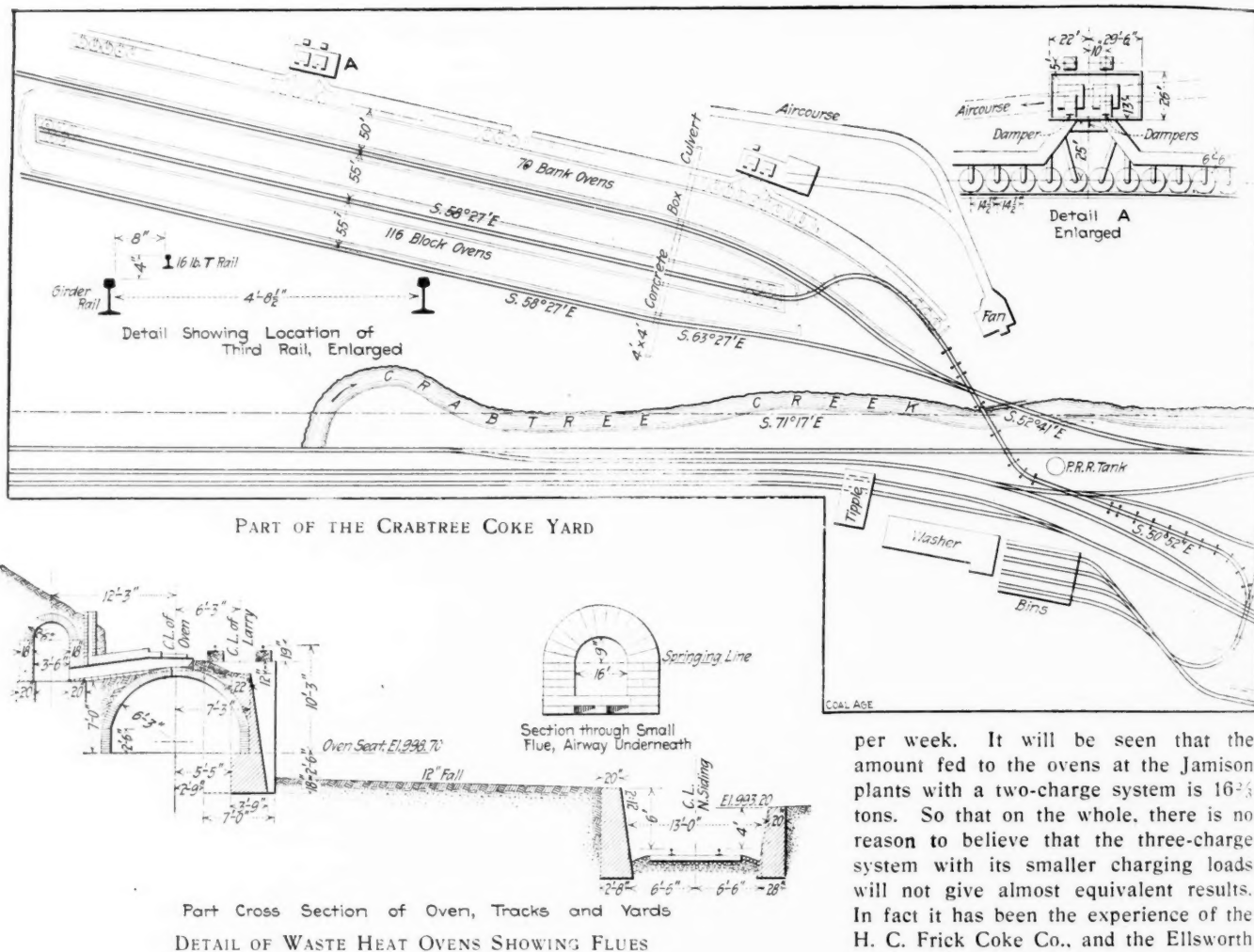
Material	96-HOUR CHARGE		
	Pounds	Per Cent. of Charge	Per Cent. of Output
Washed coal.....	17,655	100.00	136.42
Good foundry coke.....	10,330	58.51	79.82
Culls.....	2,044	11.58	15.79
Breeze.....	568	3.21	4.39
Total output.....	12,942	73.30	100.00

A 96-hour charge stands about 40 in. deep in the oven, and after coking it will be found shrunken to about 28 in. When coal is taken direct from the washer to the ovens, without the delay in the tanks, of which mention has been made, it is two hours before it begins to coke; but as a result of the opportunity the coal has to drain off, the time at the Jamison works is reduced to one hour. The door of the oven, which is only built about half way up to the soffit of the arched opening, is after this hour raised almost to the full height, the bricks being plastered with wet loam to exclude all air, except such as can enter above the coal. This prevents wasteful oxidation or burning of the charge.

The bricks forming the door are wet, to the full height of the slack bed, due to the dampness of the charge. As coking takes place, the bricks gradually dry, and when the coking reaches the oven floor, the entire door ceases to show evidences of moisture. This requires about 36 hours. Such coke, however, is light and weak, and the additional time given the process completes the driving off of the volatile matter and makes a heavier and stronger product. It may be noted that there is a deposit of carbon on those parts of the coke through which the rising gases escape, and the amount of this deposit varies from 3 to 5 per cent. The coke ovens at plant No. 1 are not at present in operation, and No. 2, though producing the best of coke, does not embody all the latest features of coke-making economy. Steam locomotives are used for hauling the larries to the oven and no use is made of the waste gases. It is the intention, however, to make the coke ovens supply the heat for operating this plant and the change will be made without delay because the test at No. 4 has shown that the waste-heat coke oven is a gilt-edged investment.



WASTE HEAT OVENS AND BOILER HOUSE PLANT NO. 4



EACH OVEN MAKES 22 HP., ONE MAN OVERSEES 1600 HP.

At plant No. 4, seventy ovens are supplying all the heat needed for the operation of four 400-hp. boilers. In order to shorten the flues leading to these, there are two boiler houses set just back of the line of ovens, each house being connected with 35 ovens. By these arrangements a more even draft is secured for each oven, than if the boiler houses were combined and set at one end of the long line.

One man attends to all four boilers and watches the fan engine. He does not have much to occupy him physically or mentally and a high-priced man is not needed. Liberal allowances for interest, depreciation and repair leave a margin of about \$20,000 over the coal firing. The cost of installation, including flues, boilers, steam lines, water lines complete, was approximately \$350 per oven.

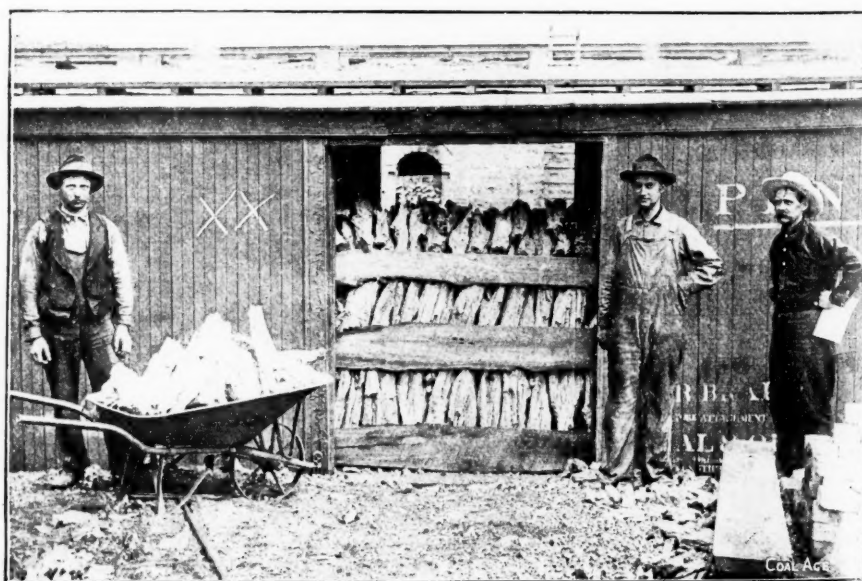
It will be seen that each oven provides about 22 hp. It is not thought that the continuous making of foundry coke changes the heat output in any material degree. It is true that the ovens are less frequently charged but, at the same time, larger charges are used and thus the conditions are not so unequal as might at first appear.

ANY OVEN SHOULD PROVIDE 20 HP.

An oven operating on the regular cycle, but of like diameter to those at the Jamison plants (12 ft. 6 in.), is charged every week with two chargings of about five tons each, and on Friday or Saturday with 6½ tons, a total of 16½ tons

per week. It will be seen that the amount fed to the ovens at the Jamison plants with a two-charge system is 16½ tons. So that on the whole, there is no reason to believe that the three-charge system with its smaller charging loads will not give almost equivalent results. In fact it has been the experience of the H. C. Frick Coke Co., and the Ellsworth Coal Co., that 20 hp. is to be expected from a single coke oven.

The method of utilizing the waste gases has been developed by several experiments during the last few years. The heated gas is taken from the trunnel-head. This head can be covered by a large firebrick lid. When this is closed the gas passes through a conduit built on



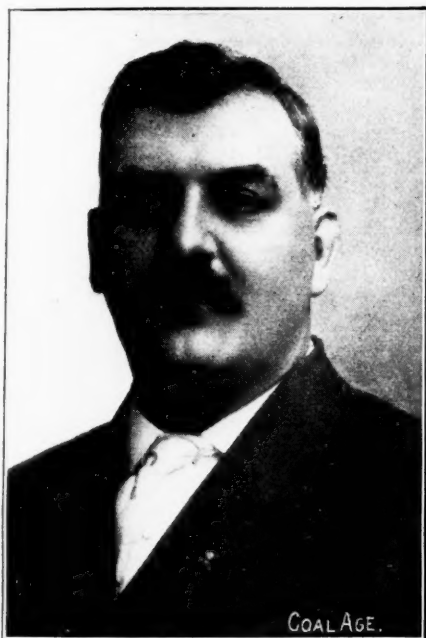
A CAR OF 72-HR. FOUNDRY COKE



a slightly descending grade toward the main flue. When first installed the small flues were covered by the slope of the bank of earth by which the main flue was protected, but it was found later to be a better plan to leave them uncovered as in the sectional elevation shown, because the intense heat did not then have as great an effect on their firebrick arches.

#### CLOSING OFF BOILERS

The large brick flue at the back of the oven leads the gas away to the nearest boiler house. Should it be desirable to clean any boiler or to shut it off for repairs, a damper provides the means and a cross-flue between the flue to the right-hand boiler and that to the left permits the gases from one flue to be sidepassed from the boiler they normally heat to that which under ordinary conditions is heated by the adjacent stack of ovens.



EDWARD SOPPITT

It is, of course, possible to overheat an oven, and this is not desirable, as the coke is thereby rendered brittle and valueless. But if the temperature be too low, the coke has black butts near the oven floor and is discolored in other places. As this half-coked coal and soot are undesirable, a sufficient heat to eliminate them and make them into a solid, shining body of coke is needed. Moreover, an intensely heated oven will eliminate somewhat more sulphur than one of lower temperature. But the present arrangement with a chimney about 130 ft. higher than the oven bed gives somewhat too much draft if not regulated, and reduction in height is proposed as remedy for this condition.

In conclusion, the ovens are giving excellent results, the coke made by them is better than that of ovens without provision for the use of the waste gases. The coke is brighter and harder and

somewhat lower in sulphur. The success attained is evidenced by the fact that some of the ovens at plant No. 2 are to be made over. It is believed that the expense for maintenance where this system is installed will not be heavy. The main flue has stood two years without needing any repair.

It may be noted that the third-rail system of transmitting power is adopted and electric larries built by the Scottdale Foundry and Machine Co., are used to convey the coal from the washery bins, an ordinary 16-lb. rail, set with its upper surface 4 in. above the track rail being used for transmission purposes. The voltage is 250 volts. The electrical equipment was furnished by the Westinghouse Electric and Manufacturing Co.

The writer is indebted to Edward Soppitt, general superintendent Pennsylvania district; C. E. Cowan, chief engineer, and John McClarren, general foreman of the coke yards, for information and assistance in preparing the article.

### Diamond Vale Disaster

The explosion which occurred at Merritt, B. C., was given a short notice in COAL AGE in the issue following the unhappy event. The report of the coroner's jury being now at hand, a further statement seems timely. Merritt is situated in the Cariboo District of British Columbia, on the Nicola River, a branch of the Fraser, and is one of the stations of the Canadian Pacific Railway.

#### REPORT OF CORONER'S JURY

The conclusion reached by the jury was that the seven men who were killed "met their death by the explosion of gas combined with coal dust coming in contact with a naked light." This statement is easy to understand despite its ill expression. The jury finds that the management was guilty of gross negligence in not having provided efficient equipment and that the company showed a disposition to evade the requirements of the Coal Mines Regulation Act. The inspector, Morgan, was also censured for not demanding a more careful compliance with the law. In addition to the seven men killed, two were injured, out of the 18 men working in the mine.

It appears that the development was new and was regarded more or less as a prospect rather than as a working mine. The equipment was such as suited an operation of little importance and one of which the future was in doubt. This was the excuse of Benjamin Browett, the superintendent, when taxed with the inadequacy of the plant. He stated that he did not think the mine was at such a state of development as to make it subject to the law and that he thought he could not be held to be amenable to its provisions without formal notification from the inspector.

#### SLOW THE FAN TO PERMIT OF HAULAGE

It was said, but denied by the engineer, that the fan could not be kept running when the haulage engine was working because the power provided was insufficient to actuate both at one and the same time.

The fireboss, Henry Grimes, one of the victims, was not a certificated man. He went into the mine at 6.45 a.m. and the men entered at 8. It was asserted that he had plenty of time to make an inspection of the limited area under operation. The fireboss was in the habit of stationing himself where the men would pass him on entering and he would notify them if their places were in an unsafe condition. He did not write his report till he came out of the mine at dinner time. He seems to have been a well meaning man and several witnesses among the miners commented favorably on his efficiency.

Evidently the mine generated gas. Open lights were used but safety lamps were carried by some of the men. Some carried both, using the former for testing purposes when gas was suspected. One man was waiting to tell the superintendent of the presence of gas when the explosion occurred. It seems as if the fireboss was active enough in the discharge of his duties but did not have a clear comprehension of the dangers to be avoided in a gaseous mine, nor was he strict enough in controlling those who would carelessly brave them.

#### "NOT AN EXPLOSION, ONLY AN INFLAMMATION"

James Ashworth, Fleet Robinson, the Dominion mineralogist and Chief Inspector Thomas Graham made a report stating that there was no explosion, but merely an inflammation of the gas followed by a burning of the coal dust. Mr. Ashworth testified that in his belief the temperature resulting from the combustion did not exceed 900 deg. F. He stated that in case of an explosion the temperature would have been 3000 deg. In support of his conclusion he brought samples of coal dust, caked but not burned, and the cap, which was worn by William Herd, one of the deceased, at the time of the accident. This was charred a little on the outside but the paper on the inside was unburned.

However, it must be questioned whether gas could ever have burned so generally through the mine without an explosion. In fact there was evidence given that sufficient force was developed to turn over a car, damage the return airway and "blow out the fan." Moreover, most of the surviving men heard the explosion, though all said the noise was faint.

As to deductions from temperatures, these are unsafe because the intensity of heat is not equal, especially when the exploded gases are small in quantity.

# Accidents in Anthracite Coal Mines

In order to understand fully the accident problem in coal mining, it is necessary to consider the bearing of particular causes in their relation to the number of persons employed. Separating at the commencement of such an inquiry, the inside from the outside employees, a marked contrast in accident liabilities can be shown. This result suggests the inadequacy of general fatality rates, since

By Frederick L. Hoffman\*

Tabulations showing the number of persons killed and injured and the nature of the accidents occurring in each inspection district of the Pennsylvania anthracite region from 1906 to 1910. It is shown that a great difference exists between districts and that a general average does not give a true idea of any one section.

TABLE I. ACCIDENTS IN THE NORTHERN ANTHRACITE COAL FIELD OF PENNSYLVANIA, 1906-1910

Year	Em- ployees	Fatal Acci- dents	Rate per 1000 Em- ploye's	Non- fatal Acci- dents	Rate per 1000 Em- ployees
INSIDE ACCIDENTS					
1906	67,852	290	4.27	587	8.65
1907	69,459	385	5.54	699	10.06
1908	73,347	366	4.99	605	8.25
1909	73,976	316	4.27	526	7.11
1910	72,993	337	4.62	505	6.92
Total.	357,627	1694	4.74	2922	8.17
OUTSIDE ACCIDENTS					
1906	21,148	49	2.03	107	4.43
1907	24,046	55	2.29	116	4.82
1908	23,889	49	2.05	109	4.56
1909	23,108	27	1.17	98	4.24
1910	22,523	30	1.33	74	3.29
Total.	117,714	210	1.78	504	4.28
ALL ACCIDENTS, INSIDE AND OUTSIDE					
1906	92,000	339	3.68	694	7.54
1907	93,505	440	4.71	815	8.72
1908	97,236	415	4.27	714	7.31
1909	97,084	343	3.53	624	6.43
1910	95,516	367	3.84	579	6.53
Total.	475,341	1904	4.01	3426	7.21

\*Statistician, Prudential Insurance Co. of America, Newark, N. J.

the proportions of inside and outside employees may vary substantially for different mining fields.

In the northern anthracite coal fields of Pennsylvania, for illustration, the average proportion of inside employees is 75.2 per cent., and of outside employees 24.8 per cent., against 65.4 per cent. and 34.6 per cent., respectively, for the combined middle and southern fields. Obviously, the fatality rates, to be trustworthy, require to be corrected for this element of error, which may, more or less, impair the trustworthiness of all general fatality tables. Unfortunately, the number of inside and outside employees of many states is not separately stated, even though the accident returns may make the distinction, but of course, without the required numbers of employees under and above ground, the data are of no practical utility.

Looking over the many items in the various tables accompanying this article,

it will be readily seen that the rate for accidental death and injuries is different in the northern fields from that in the two lower areas. Moreover, the accidents are different not only in number but also in nature—the character of the life hazard varying from field to field.

The most marked difference in the fatality rates, as calculated for various

TABLE II. ACCIDENTS IN THE MIDDLE AND SOUTHERN ANTHRACITE COAL FIELDS OF PENNSYLVANIA 1906-1910

Year	Em- ployees	Fatal Acci- dents	Rate per 1000 Em- ploye's	Non- fatal Acci- dents	Rate per 1000 Em- ployees
INSIDE ACCIDENTS					
1906	47,146	166	3.52	416	8.82
1907	48,390	216	4.46	450	9.30
1908	50,886	230	4.52	351	6.90
1909	49,296	174	3.53	328	6.65
1910	48,549	172	3.54	379	7.81
Total.	241,267	958	3.92	1924	7.88
OUTSIDE ACCIDENTS					
1906	27,029	52	1.92	102	3.77
1907	26,879	52	1.93	104	3.87
1908	26,381	33	1.25	105	3.98
1909	24,815	50	2.01	82	3.30
1910	24,110	62	2.57	92	3.82
Total.	129,211	249	1.93	485	3.75
ALL ACCIDENTS, INSIDE AND OUTSIDE					
1906	74,175	218	2.94	518	6.98
1907	75,269	268	3.56	554	7.36
1908	77,267	263	3.40	456	5.90
1909	74,111	224	3.02	410	5.53
1910	72,659	234	3.22	471	6.48
Total.	373,481	1207	3.23	2409	6.45

TABLE III. OUTSIDE FATAL ACCIDENTS IN THE ANTHRACITE COAL MINES OF PENNSYLVANIA, 1906-1910

District	Employees	Cars	Rate per 1000 Em- ployed	Ma- chin- ery	Rate per 1000 Em- ployed	Boil- er Ex- plo- sions	Rate per 1000 Em- ployed	Elec- tric- ity	Rate per 1000 Em- ployed	Suffo- cated in Chutes	Rate per 1000 Em- ployed	Other Out- side Acci- dents	Rate per 1000 Em- ployed	Total Out- side Acci- dents	Rate per 1000 Em- ployed
Northern coal field:															
1	10,762	9	0.84	11	1.02							4	0.37	24	2.23
2	13,118	14	1.07	4	0.30	1	0.08					3	0.23	22	1.68
3	11,450	4	0.35	6	0.52							2	0.17	12	1.05
4	10,743	5	0.47	4	0.37	1	0.09	1	0.09	2	0.19	4	0.37	17	1.58
5	11,331	7	0.62	4	0.35							6	0.53	20	1.77
6	12,618	11	0.87	6	0.48			2	0.16	6	0.26	8	0.63	33	2.62
7	12,455	8	0.64	3	0.24							1	0.08	5	0.40
8	11,572	7	0.60	7	0.60					1	0.09	6	0.52	21	1.81
9	12,072	3	0.25	1	0.33							6	0.50	13	1.08
10	11,593	15	1.29	7	0.60							9	0.78	31	2.67
Total.....	117,714	83	0.71	56	0.48	2	0.02	3	0.03	13	0.11	53	0.45	210	1.78
Middle and Southern coal fields:															
11	19,962	17	0.85	14	0.70					1	0.05	11	0.55	43	2.15
12	12,472	7	0.56	8	0.64							4	0.32	19	1.52
13	16,181	12	0.74	13	0.80					2	0.12	7	0.43	34	2.10
14	10,569	9	0.85	7	0.66					1	0.09	5	0.47	22	2.08
15	12,468	7	0.56	7	0.56					1	0.08	4	0.32	19	1.52
16	11,660	5	0.43	4	0.34	1	0.09					4	0.34	14	1.20
17	11,108	11	0.99	9	0.81					4	0.36	8	0.72	32	2.88
18	12,949	14	1.08	5	0.39					1	0.08	10	0.77	30	2.32
19	12,862	12	0.93	3	0.23							7	0.54	22	1.71
20	8,983	8	0.89							2	0.22	4	0.45	14	1.56
Total.....	129,214	102	0.79	70	0.54	1	0.01			12	0.09	64	0.50	249	1.93
Grand total...	246,928	185	0.75	126	0.51	3	0.01	3	0.01	25	0.10	117	0.47	459	1.86



TABLE IV. INSIDE FATAL ACCIDENTS IN THE ANTHRACITE COAL MINES OF PENNSYLVANIA, 1906-1910

District	Employees	Falls of Coal or Roof	Rate per 1000 Em- ployed	Mine Cars	Rate per 1000 Em- ployed	Ex- plosions of Gas or Dust	Rate per 1000 Em- ployed	Suffo- cated by Gas	Rate per 1000 Em- ployed	Ex- plosions of Pow- der, etc.	Rate per 1000 Em- ployed	Prem- ature Blasts	Rate per 1000 Em- ployed
Northern coal field:													
1	32,324	83	2.57	23	0.71					6	0.19	9	0.28
2	41,902	90	2.15	21	0.50	13	0.31			3	0.07	25	0.60
3	40,159	100	2.49	27	0.67					6	0.15	38	0.95
4	34,492	89	2.58	27	0.78	14	0.41			4	0.12	25	0.72
5	31,043	82	2.64	18	0.58	1	0.03	1	0.03	1	0.03	5	0.16
6	35,739	93	2.60	20	0.56	21	0.59	2	0.06	10	0.28	23	0.64
7	35,381	93	2.63	45	1.27	19	0.54	9	0.25	10	0.28	21	0.59
8	34,049	93	2.73	27	0.79	20	0.59	2	0.06	3	0.09	18	0.53
9	38,246	83	2.17	26	0.68	26	0.68	9	0.24	5	0.13	17	0.44
10	34,292	72	2.10	26	0.76	21	0.61	15	0.44	4	0.12	16	0.47
Total	357,627	878	2.46	260	0.73	135	0.38	38	0.11	52	0.15	197	0.55
Middle and Southern coal fields:													
11	37,266	61	1.64	28	0.75	2	0.05	1	0.03	7	0.19	19	0.51
12	25,596	58	2.27	17	0.66	7	0.27	1	0.04	4	0.16	15	0.59
13	25,450	42	1.65	17	0.67	10	0.39	4	0.16	13	0.51	5	0.20
14	17,125	20	1.17	7	0.41	2	0.12	1	0.06	2	0.12	5	0.29
15	28,003	52	1.86	15	0.54	13	0.46	1	0.04	1	0.14	17	0.61
16	23,900	53	2.22	12	0.50	1	0.04	1	0.04	1	0.17	10	0.42
17	20,267	18	0.89	15	0.74	5	0.25	3	0.15	9	0.44	6	0.30
18	23,862	43	1.89	17	0.71	10	0.42	10	0.42	9	0.38	11	0.46
19	22,678	35	1.54	4	0.18	7	0.31			1	0.04	10	0.44
20	20,120	24	1.19	16	0.80			2	0.10	7	0.35	4	0.26
Total	244,267	406	1.66	148	0.61	57	0.23	24	0.10	60	0.25	102	0.42
Grand total	601,894	1284	2.13	408	0.68	192	0.32	62	0.10	112	0.19	299	0.50

District	Falls Into Shafts, etc.	Rate per 1000 Em- ployed	Crushed at Bat- teries	Rate per 1000 Em- ployed	Kicked by Mules	Rate per 1000 Em- ployed	Ma- chin- ery	Rate per 1000 Em- ployed	Elec- tricity	Rate per 1000 Em- ployed	Other Inside Acci- dents	1000 Em- ployed	Total Inside Acci- dents	Rate per 1000 Em- ployed
Northern coal field:														
1	4	0.03			2	0.06					3	0.09	127	3.93
2	12	0.29			1	0.02					4	0.10	169	4.03
3	6	0.15			2	0.05			1	0.02	3	0.07	183	1.56
4	3	0.09			2	0.06	1	0.03	2	0.06	2	0.06	169	4.90
5	4	0.13			1	0.03	2	0.06					115	5.70
6	7	0.20			1	0.03					9	0.25	186	5.20
7	1	0.03					1	0.03			12	0.34	211	5.96
8	6	0.18					1	0.03	2	0.06	7	0.21	179	5.26
9	2	0.05			2	0.05					8	0.21	178	4.65
10	10	0.29			1	0.03	2	0.06	1	0.03	9	0.26	177	5.16
Total	52	0.15			12	0.03	7	0.02	6	0.02	57	0.16	1694	4.74
Middle and Southern coal fields:														
11	7	0.19	1	0.03	2	0.05			1	0.03	10	0.27	139	3.73
12	8	0.31	4	0.16							6	0.23	120	4.69
13	1	0.04							1	0.04	13	0.51	106	4.17
14	2	0.12	2	0.12							4	0.23	45	2.63
15	2	0.07			1	0.04					6	0.21	111	3.96
16	9	0.38	2	0.08							1	0.04	93	3.89
17	3	0.15	1	0.05	4	0.20			5	0.25	15	0.74	84	4.14
18	8	0.34	2	0.08	2	0.08					9	0.38	121	5.97
19	7	0.31									6	0.26	70	3.09
20	5	0.25	1	0.05	1	0.05					9	0.45	69	3.43
Total	52	0.21	13	0.05	10	0.04			7	0.03	79	0.32	958	3.92
Grand total	104	0.17	13	0.02	22	0.04	7	0.01	13	0.02	136	0.23	2652	4.41

TABLE V. OUTSIDE NON-FATAL ACCIDENTS IN THE ANTHRACITE COAL MINES OF PENNSYLVANIA, 1906-1910

District	Employees	Cars	Rate per 1000 Employed	Ma-chin-ery	Rate per 1000 Employed	Boil-er Ex-plosions	Rate per 1000 Employed	Elec-tricity	Rate per 1000 Employed	Other Outside Acci-dents	Rate per 1000 Employed	Total Outside Acci-dents	Rate per 1000 Employed
Northern coal field:													
1	10,762	28	2.60	9	0.84	...	...	...	...	18	1.67	55	5.11
2	13,118	17	1.30	4	0.30	...	...	...	...	11	0.84	32	2.44
3	11,450	13	1.11	10	0.87	...	...	...	...	17	1.48	40	3.49
4	10,743	9	0.84	5	0.47	1	0.09	1	0.09	13	1.21	29	2.70
5	11,331	22	1.94	6	0.53	...	...	...	...	17	1.50	45	3.97
6	12,618	19	1.51	12	0.95	...	...	...	...	31	2.46	62	4.91
7	12,455	30	2.41	13	1.04	1	0.08	...	...	27	2.17	71	5.70
8	11,572	18	1.56	13	1.12	...	...	...	...	29	2.51	60	5.18
9	12,072	11	0.91	3	0.25	2	0.17	...	...	24	1.99	40	3.31
10	11,593	29	2.50	11	0.95	...	...	...	...	30	2.59	70	6.04
Total	117,714	196	1.67	86	0.73	4	0.03	1	0.01	217	1.84	504	4.28
Middle and Southern coal fields:													
11	19,962	11	2.05	22	1.10	...	...	...	...	44	2.20	107	5.36
12	12,472	6	0.48	6	0.48	...	...	...	...	3	0.24	15	1.20
13	16,181	11	0.68	16	0.99	...	...	...	...	18	1.11	45	2.78
14	10,569	11	1.04	16	1.51	...	...	...	...	26	2.46	53	5.01
15	12,468	6	0.48	7	0.56	...	...	...	...	10	0.80	23	1.84
16	11,660	13	1.11	9	0.77	1	0.09	...	...	20	1.72	43	3.69
17	11,108	15	1.35	4	0.36	...	...	...	...	23	2.07	42	3.78
18	12,949	19	1.47	12	0.93	2	0.15	...	...	38	2.93	71	5.48
19	12,862	14	1.09	8	0.62	...	...	...	...	12	0.93	34	2.64
20	8,983	21	2.67	9	1.00	...	...	...	...	19	2.12	52	5.79
Total	129,214	160	1.24	109	0.84	3	0.02	...	...	213	1.65	485	3.75
Grand total	246,928	356	1.14	195	0.79	7	0.03	1	0.00	430	1.74	989	4.01

causes, are in the accidents due to falls of coal and roof. The respective rates were 2.46 per 1000 of inside employees for the northern coal fields, against only 1.66 for the middle and southern fields. In none of the other causes are the differences of enough importance for record, except possibly explosions of gas or dust, the rate for which in the northern coal field was 0.38 per 1000, against 0.23 in the middle and southern coal fields.

The returns of non-fatal accidents, in table IV are of doubtful accuracy and completeness and are limited probably to the more serious injuries causing extended incapacity for work. The marked differences in the non-fatal accident rates between the northern field and the middle and southern coal areas, are probably due more to methods of reporting them than to actual differences in the true non-fatal accident liability of inside employees. It is suggestive, however, to

find a marked difference in the non-fatal accident rate due to mine cars, which was 2.14 per 1000 for the northern coal fields and only 1.35 for the other two. In contrast, the non-fatal accident rate due to explosions of gas and dust was only 0.90 per 1000 in the northern, against 1.52 in the middle and southern coal fields.

Although the non-fatal accident returns are more or less untrustworthy, the data have some value if only to emphasize the fact that in all probability only the more severe accidents are at present reported. There can be no question of doubt that if a drastic workmen's compensation act were to be adopted by the State of Pennsylvania, and applied to the mining industry, the results would be the same as observed in England, namely, that the non-fatal accident rates would increase largely on account of the fact that complete reports would be made of

every injury, however, trifling, which resulted from an accident incidental to mine work.

This comparison clearly emphasizes the local incidence of fatal and non-fatal accidents in anthracite coal mining, and the method is applicable to every coal-field of North America. For a full understanding of the underlying causes responsible for the occurrence of fatal and non-fatal accidents it is of the utmost importance that the correct incidence should be localized as much as possible and that attention should be directed to specific facts rather than to widely generalized conclusions.

The non-fatal accident rate in the northern anthracite coalfields is reported as 7.21 per 1000, the highest rate being for the eighth district, where it was 10.85 per 1000, and the lowest for the second district, where it was 4.69 per 1000. The highest and lowest non-fatal acci-

TABLE VI. INSIDE NON-FATAL ACCIDENTS IN THE ANTHRACITE COAL MINES OF PENNSYLVANIA, 1906-1910

District	Employees	Falls of Coal and Roof	Rate per 1000 Employed	Mine Cars	Rate per 1000 Employed	Explosions of Gas or Dust	Rate per 1000 Employed	Explosions of Powder, etc.	Rate per 1000 Employed	Premature Blasts	Rate per 1000 Employed
Northern coal field:											
1	32,324	123	3.81	63	1.95	11	0.26	8	0.25	14	0.43
2	41,902	91	2.17	67	1.60	11	0.26	5	0.12	26	0.62
3	40,159	102	2.54	79	1.97	15	0.37	5	0.12	38	0.95
4	34,492	124	3.60	73	2.12	8	0.23	10	0.29	47	1.36
5	31,043	100	3.22	58	1.87	13	0.42	9	0.29	21	0.68
6	35,739	103	2.88	75	2.10	68	1.90	12	0.34	35	0.98
7	35,381	103	2.91	101	2.85	37	1.05	12	0.34	30	0.85
8	34,049	125	3.67	113	3.32	73	2.14	25	0.73	53	1.56
9	38,246	78	2.04	70	1.83	78	2.04	10	0.26	20	0.52
10	34,292	92	2.68	67	1.95	19	0.55	3	0.09	20	0.58
Total	357,627	1041	2.91	766	2.14	322	0.90	99	0.28	304	0.85
Middle and Southern coal fields:											
11	37,266	122	3.27	62	1.66	46	1.23	24	0.64	45	1.21
12	25,596	38	1.48	15	0.59	31	1.21	11	0.43	9	0.35
13	25,450	53	2.08	19	0.75	34	1.34	8	0.31	13	0.51
14	17,125	42	2.45	34	1.99	35	2.04	7	0.41	6	0.35
15	28,003	26	0.93	19	0.68	4	0.14	4	0.14	10	0.36
16	23,900	107	4.48	42	1.76	38	1.59	19	0.79	22	0.92
17	20,267	16	0.79	23	1.13	47	2.32	6	0.30	16	0.79
18	23,862	88	3.69	51	2.14	62	2.60	11	0.46	42	1.76
19	22,678	42	1.85	20	0.88	57	2.51	8	0.35	10	0.44
20	20,120	64	3.18	45	2.24	17	0.84	11	0.55	9	0.45
Total	244,267	598	2.45	330	1.35	371	1.52	109	0.45	182	0.75
Grand total	601,894	1639	2.72	1096	1.82	693	1.15	208	0.35	486	0.81

District	Falls Into Shafts, etc.	Rate per 1000 Employed	Crushed at Batteries	Rate per 1000 Employed	Kicked by Mules	Rate per 1000 Employed	Ma-chin-ery	Rate per 1000 Employed	Elec-tricity	Rate per 1000 Employed	Other Inside Acci-dents	Rate per 1000 Employed	Total Inside Acci-dents	Rate per 1000 Employed
Northern coal field:														
1	1	0.03	1	0.03	7	0.22	1	0.03	1	0.03	21	0.65	237	7.33
2	1	0.03	1	0.03	10	0.24	1	0.02	1	0.03	15	0.36	226	5.39
3	1	0.03	1	0.03	8	0.20	1	0.02	1	0.03	21	0.52	268	6.67
4	1	0.03	1	0.03	11	0.32	6	0.17	1	0.03	25	0.72	305	8.84
5	1	0.03	1	0.03	2	0.06	2	0.06	1	0.03	17	0.55	222	7.15
6	1	0.03	1	0.03	4	0.11	3	0.08	1	0.03	28	0.78	329	9.21
7	1	0.03	1	0.03	8	0.23	1	0.03	1	0.03	44	1.24	337	9.52
8	1	0.03	1	0.03	13	0.38	5	0.15	1	0.03	28	0.82	435	12.78
9	1	0.03	1	0.03	5	0.13	1	0.03	1	0.03	49	1.28	311	8.13
10	8	0.23	1	0.03	7	0.20	1	0.03	1	0.03	35	1.02	252	7.35
Total	11	0.03	1	0.00	75	0.21	19	0.05	1	0.00	283	0.79	2922	8.17
Middle and Southern coal fields:														
11	7	0.19	1	0.03	3	0.08	1	0.04	1	0.04	39	1.05	349	9.37
12	5	0.20	1	0.04	1	0.04	1	0.04	1	0.04	10	0.39	116	4.53
13	5	0.20	1	0.04	1	0.04	1	0.04	1	0.04	19	0.75	152	5.97
14	4	0.23	12	0.70	7	0.41	1	0.06	1	0.06	16	0.93	164	9.58
15	2	0.37	1	0.04	1	0.04	1	0.04	1	0.04	16	0.57	83	2.96
16	4	0.17	1	0.04	2	0.08	3	0.13	1	0.04	17	0.71	254	10.63
17	16	0.79	5	0.25	1	0.05	2	0.10	1	0.04	21	1.04	153	7.55
18	16	0.67	1	0.04	3	0.13	1	0.04	1	0.04	32	1.34	305	12.78
19	2	0.09	1	0.04	1	0.04	3	0.13	1	0.04	19	0.84	162	7.14
20	19	0.94	2	0.10	3	0.15	1	0.04	1	0.04	16	0.80	186	9.24
Total	75	0.31	20	0.08	23	0.09	11	0.05	1	0.00	205	0.84	1924	7.88
Grand total	86	0.14	21	0.03	98	0.16	30	0.05	1	0.00	488	0.81	4846	8.05



dent rates do not coincide by districts with the corresponding fatal accident rates, which were highest in the seventh district and lowest in the fifth.

The average non-fatal accident rate for the middle and southern coalfields was 6.45 per 1000, the rate having been highest in the eighteenth district, or 10.21 per 1000, and lowest in the fifteenth district, or 2.62 per 1000. The highest non-fatal accident rate coincides with the highest fatal accident rate in the middle and southern anthracite coal fields, but there is no complete conformity in the rates, which, of course, may be due to local conditions rather than to defects in the returns.

TABLE VII. FATAL ACCIDENTS IN THE ANTHRACITE COAL MINES OF PENNSYLVANIA, 1906-1910

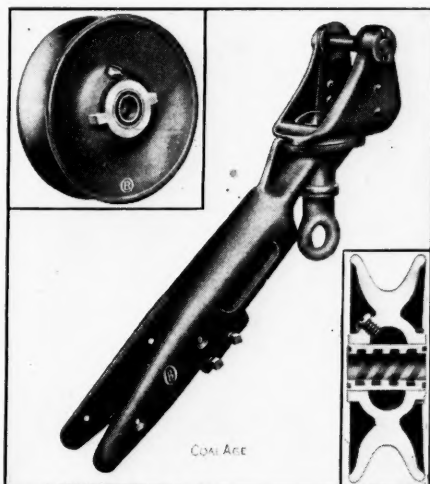
District	Employees	Fatal Accidents	Rate per 1000 Employed
Northern coal field:			
1	43,086	151	3.50
2	55,020	191	3.47
3	51,609	195	3.78
4	45,235	186	4.11
5	42,374	135	3.19
6	48,357	219	4.53
7	47,836	228	4.77
8	45,621	200	4.38
9	50,318	191	3.80
10	45,885	208	4.54
Total.....	475,341	1904	4.01
Middle and Southern coal fields:			
11	57,228	182	3.18
12	38,068	139	3.65
13	41,631	140	3.37
14	27,694	67	2.42
15	40,471	130	3.21
16	35,560	107	3.01
17	31,375	116	3.70
18	36,811	151	4.10
19	35,540	92	2.59
20	29,103	83	2.85
Total.....	373,481	1207	3.23
Grand total..	848,822	3111	3.67

TABLE VIII. NON-FATAL ACCIDENTS IN THE ANTHRACITE COAL MINES OF PENNSYLVANIA, 1906-1910

District	Employees	Fatal Accidents	Rate per 1000 Employed
Northern coal field:			
1	43,086	292	6.78
2	55,020	258	4.69
3	51,609	308	5.97
4	45,235	334	7.38
5	42,374	267	6.30
6	48,357	391	8.09
7	47,836	408	8.53
8	45,621	495	10.85
9	50,318	351	6.98
10	45,885	322	7.03
Total.....	475,341	3426	7.21
Middle and Southern coal fields:			
11	57,228	456	7.97
12	38,068	131	3.44
13	41,631	197	4.74
14	27,694	217	7.84
15	40,471	106	2.62
16	35,560	297	8.35
17	31,375	195	6.22
18	36,811	376	10.21
19	35,540	196	5.51
20	29,103	238	8.18
Total.....	373,481	2409	6.45
Grand total..	848,822	5835	6.87

## Mine Trolley Harp and Wheel

Probably no single piece of machinery in use around the mines is liable to more hard knocks and general abuse than the trolley of the average mine locomotive. With well known frequency its wheel leaves the wire and bangs up against the roof for a distance, catching, perhaps, on timbers, beams and other obstacles. No little ingenuity has been displayed by various manufacturers in designing trolley poles, harps, etc., in an effort to minimize mishaps of the nature indicated and one of the most recent designs of harp and wheel is that of the Ohio Brass Co., shown in the accompanying illustration.



TROLLEY HARP AND WHEEL

A special feature of the harp is the provision made for rotating it by hand, thus enabling the motorman to guide it easily through frogs and over particularly uneven places in the trolley. The pivot bolt, fastened to the harp casting, passes through the pole-end casting and is provided at its lower end with an eye which rotates with the harp. A stick or strap, attached to this eye, enables the operator to control the harp at all times.

In addition to the feature of manual operation, the harp is designed to work automatically; the center of the wheel axle is set back from the pivot point so that a trailing action is imparted to the wheel, causing it readily to follow irregularities in the trolley wire and take sharp curves without pulling from the wire.

A rib on the top of the pole-end casting prevents the harp from catching on overhead I-beams in case the wheel leaves the wire. It is made either entirely of malleable iron, Sherardized, or with bronze harp casting and malleable iron pole-end, and will take all standard 4-in. mine trolley wheels with 1/2 x 1/2-in. hubs.

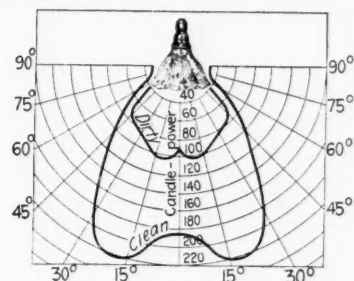
The wheel is designed to give maxi-

mum wear, having heavy flanges which will resist bending and a heavy section of metal at the bottom of the groove where the wear is greatest. Lubrication is provided for by an oil reservoir, in addition to a Bound Brook type bushing, with graphite inserted in grooves in the special bearing metal of which it is made. The bushings are 1 1/2 in. long and 1/2-in. bore and the wheel will fit any standard harp.

## Lamp Efficiency

Every mining man is familiar with the dirty, greasy and neglected incandescent lamps commonly found in some obscure part of breakers, fan-houses or mines. To those who are responsible for this condition, the following excerpt from an article on "Upkeep of Shop Lighting Systems," in the *American Machinist*, will no doubt prove a revelation:

The serious loss of light when globes and reflectors are allowed to go for long periods without cleaning, is shown in the accompanying figure. This set of curves resulted from a test on a glass



CURVES SHOWING LOSSES DUE TO UNCLEAN LAMPS

reflector (commonly called a shade) used with a tungsten lamp. The one curve shows the value of the light given by the lamp at different angles when the lamp and reflector are clean, while the smaller curve shows the enormous reduction of light after the lamp and reflector had been in service for about four months without being cleaned.

In this particular case, which is a typical one, the loss of light at the end of the four months amounted to nearly 50 per cent. The cost of electrical energy in the shop where this test was made was such that the loss of light during the four months amounted to about 12c., while the total cost of taking down, washing and replacing this reflector amounted to about 3c., so that the economy of a fairly frequent attention to the cleaning of such reflectors, even if the improved condition of the light in itself be ignored, is at once apparent.

When handling coal in a breaker great care should be taken to reduce breakage to a minimum. Sloping chutes should be curved to prevent the coal going too fast; all corners should be rounded so there are no sudden drops or sharp angles; perpendicular chutes or shafts should be constructed shelf-like to deflect the coal from side to side, thus overcoming the straight drop which is a great source of breakage.

# The Consolidated Fuel Co. of Utah

By Benedict Shubart\*

A description of a characteristic mountain coal operation and some of the difficulties encountered. A gravity plane, nearly two miles long, is in use, the grades on which are so light that the data given form a valuable addition to the technical literature on this subject. The tippie is equipped with a gravity rotating dump and has a capacity of 3000 tons per 8-hour day.

\*Boston Building, Denver, Colo.

Up to three or four years ago, one of the least known coal fields in the United States was that lying south of the town of Price, Carbon County, Utah. For many years past, the Utah Fuel Co. has been operating on the northern edge of this field, at Sunnyside, and on the western edge, at Castle Gate, Winter Quarters and Clear Creek. The southern body of the coal, however, lies in a very rugged country, and engineering difficulties connected with the railroad construction, deterred investigators from attempting the opening up of this field. In fact, the operators first occupying the field claimed that all the available coal was controlled by them, and that no new mines could be opened up.

## PRELIMINARY WORK

Some five or six years ago, Arthur A. Sweet, of Salt Lake, a promoter of great ingenuity and daring, entered the field, bought up several thousand acres of coal land in Miller Creek Cañon, and started the construction of what is now the South-

tem will swing its line south, to intersect the field.

## THE GRAVITY PLANE

While not the first independent operator on the Sunnyside seam, the Consolidated Fuel Co. is the first to open up the southern portion. The tippie is situated at the southern end of the railroad and the mine is two miles farther up Miller Creek, and is connected with the tippie by means of a gravity plane.

The flatness of this plane makes it worthy of consideration. With a total length of 10,400 ft., starting with a 9 per cent. grade and ending up with a 4 per cent., it has been found thoroughly practicable to operate and land the trip without difficulty upon the tippie. Of course, in order to secure these results on such flat grades, it was necessary to construct a track of the highest quality, to use very efficient and frictionless sheaves, and pit cars with very low roll-

The railroad, having no grade against the loaded trains, is capable of handling a large tonnage.

Geologically, the seam now being worked is a continuation of the Sunnyside seam. It lies almost level and varies



FIG. 1. SOME HEAVY WORK ON THE GRAVITY PLANE

ern Utah R.R. Encountering many unforeseen difficulties, both in engineering and financing, he surrendered the management of the company to his brother, Fred A. Sweet, also of Salt Lake, who had just successfully completed the construction of the American Falls Canal, in Idaho. Under his guidance the railroad was pushed through, and the development of the Consolidated Fuel Co.'s Hiawatha mine was carried through to its present state of completeness.

By careful location, the railroad, 16 miles in length, from Price to Hiawatha, was built, with a maximum grade of 4 per cent., and this only for a short stretch.

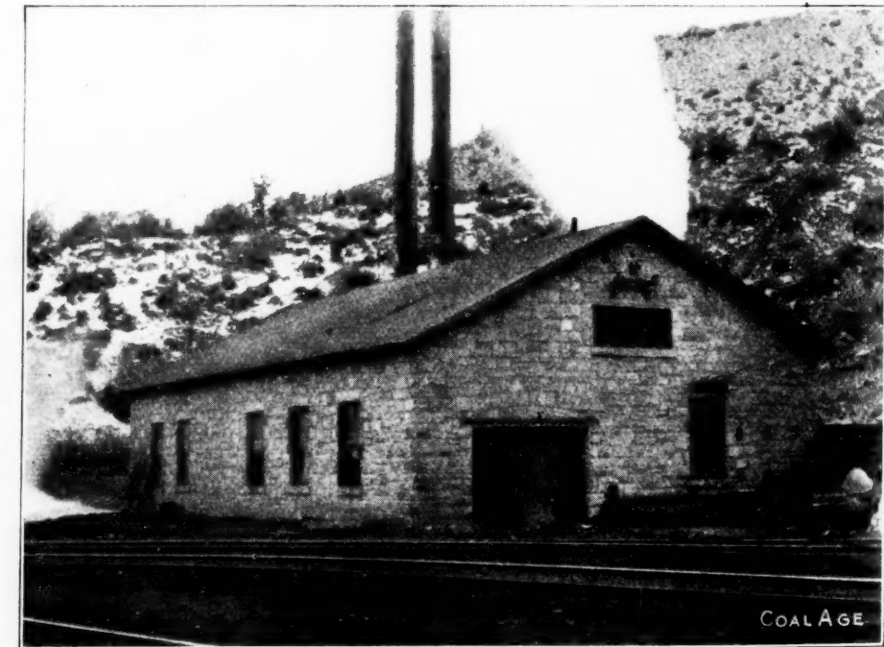


FIG. 2. GENERAL VIEW OF THE STONE POWER HOUSE

in thickness from 17 ft. to 35 ft. The coal is quite clean, has a fine, glossy fracture, and stands handling better than any Western coal I have ever examined. The coal east of the circle defined by Sunnyside, Castle Gate, Clear Creek, Hiawatha and Mohrland has been eroded. The southern boundary has not been thoroughly determined, but the field is so extensive that its exhaustion is a matter of many years.

The next five years will probably see immense developments in this field. Railroad lines are being surveyed to give an outlet to southern Utah, and it is decidedly probable that one of the large sys-

ing friction. A special design of roller-bearing wheels, made by the Watt Mining Car Wheel Co., is used, and the first design tried was found to require a considerable amount of correction. Small troubles cropped out, and it was only after a great deal of patient work that the company evolved a satisfactory and successful roller bearing. The rope rollers are of manganese steel, very light, and mounted on Hyatt roller bearings. The gravity sheaves were specially designed by the Denver Engineering Works Co. The magnificent roadbed of this gravity plane is shown in the accompanying half-tone, Fig. 1. Running through a cañon as



rugged as can well be imagined, this tramway was completed with only two curves.

#### SYSTEM OF MINING AND HAULAGE

As the seam is intercepted by the cañon, two mines have been opened up, the No. 1 at the left and the No. 2 at the right, as will be seen in Fig. 3, which shows the head of the incline with the hoist house and the transformer house.

The mines were originally opened up on the double-entry system, but are now being changed to a four-entry system. The coal is mined by the room-and-pillar system, with pillars about 55 ft. thick, and rooms about 25 ft. wide. A bench of about 9 ft. of coal is taken down first, and the balance of the roof coal, together with the pillars, will be brought back later when the rooms on the entry are finished.

The ventilation is obtained by a 7½-ft. Stevens fan, belt driven by a Ridgway variable-speed motor; the variable speed gives great flexibility to the air supply. A 6-ft. Jeffrey propeller fan is used to assist until the two mines are connected.

The entire haulage in the mine is done by electric motors, 6-ton Goodman being used for gathering the coal, and 10-ton

hp., motor-generator sets, which furnish 250-volt current for the mine. These were furnished by the General Electric Co. and the Ridgway Dynamo & Engine Company.

#### THE TIPPLE

The tippie, which was designed by the Link-Belt Co., presents a number of interesting features. Instead of using the old style crossover dump, a gravity rotating dump is used. The coal is discharged into a 20-ton hopper, from which it is automatically fed in an even stream on to the shaking screen. The results obtained with this feeder are so good that when running at the rate of 3000 tons per day, practically all the under size is taken out on the first 6 ft. of the screen. The slack is rescreened in a revolving screen, so no dust is shipped.

In order to prevent undue breaking of coal, a special apron is used for the lump screen. It takes the form of an adjustable, shaking chute, which is practically a continuation of the shaker screen. The delivery end can be raised, lowered or extended, so that open cars or box cars can be loaded with a minimum drop of the coal. This is necessary, due to the mixed character of the cars obtainable. The railroad furnishes anything from a 30,000-lb. to a 100,000-lb. gondola car, 30,000-lb. box cars to automobile cars, and it is often necessary to load hopper-bottom cars with sides as high as 10 ft. 6 in. above the rail.

The mine has now been in operation for 18 months. Its daily production is in excess of 1800 tons, and with the equipment now on hand, 3000 tons per 8-hour day can easily be handled. It is interesting to note that over the two-mile incline, in spite of the flat grade, coal has been repeatedly run for several hours at a time at a rate in excess of 4000 tons in eight hours.

### Report on the Landslide at Frank, Alberta

On Apr. 29, 1903, a landslide occurred at Frank, Alberta, causing the loss of 70 lives in the town and the destruction of much property, including 7000 ft. of the Crows Nest Ry. The slide occurred on the north side of Turtle Mountain, which is due south of the town. As it appeared quite possible for further sliding to take place, which might not only destroy the town, but shut off the coal mines west of Frank and perhaps permanently close the Crows Nest pass, a commission was appointed by the Department of Mines, of Canada, to make an investigation. The report<sup>1</sup> of the com-

mission, which consisted of Reginald A. Daly, W. G. Miller and George S. Rice, has recently been published and recommends the abandonment of the Frank townsite.

The geological profile of Turtle Mountain shows that the foot on the northern side is made up of beds of sandstone interbedded in shale. The beds dip toward the west at a steep angle. These beds are bounded on the north by a thrust plane dipping westward at an angle of about 50° and which is the plane of contact of the shale-sandstone beds with the limestone that forms the major portion of the upper part of the mountain. The limestone dips to the west at an angle of about 50° and lies unconformably on the shale. A short distance above the thrust plane the limestone beds are contorted in what are known as the contorted zones. The limestone is jointed, the joints running at right angles to the dip and continuing to the thrust plane.

Two coal mines are operated along the foot or east base of Turtle Mountain. The seam is nearly vertical and is in the shale series. Both mines are the property of the Canadian Coal Consolidated, Ltd., and formerly belonged to the Canadian-American Coal & Coke Co. The strike of the seam is north and nearly parallel to the long axis of Turtle Mountain. Mining was started in 1901 and prior to Apr. 29, 1903, the walls of part of the worked out portion of the southern end of the seam had caved. The joints in the limestone appear from the profiles prepared by the commission, to dip directly toward, but not to continue as far as, the main coal seam. The slide seems to have taken place in a direction approximately parallel to these joints.

The commission regards the slide as having been caused by natural conditions and by the mining operations in the coal seam. Excepting at the places known as the North Peak block and South Peak block and the fissured ground between them, the commission is not of the opinion that the danger of more heavy slides into the Frank Valley is imminent, but states that it is impossible to deny the existence of danger in certain places. The course of future slides would probably be in the already mined and now uninhabited area covered by the 1903 slide. It has designated a certain area of the coal seam as lying within a zone of danger from further landslides, and on account of the unstable condition from natural causes, has recommended the abandonment of the townsite of Frank whether the coal seam is worked in the danger zone or not.

Dispatches from Frank on Mar. 30 state that serious slides are taking place. Much alarm is being felt in the town and many people are reported to be moving out of the danger zone.

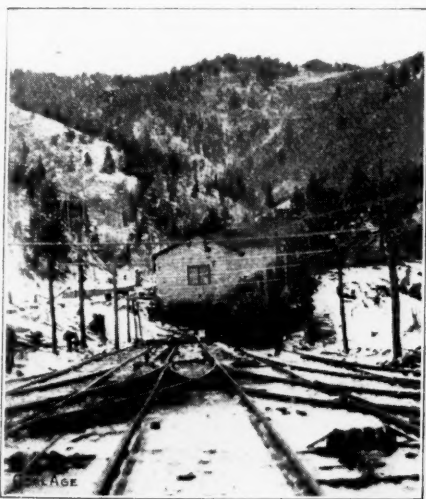


FIG. 3. THE TOP OF THE GRAVITY PLANE

Goodman locomotives being used for the main haulage. The trips are delivered by the locomotives to the head of the incline, from which point they are handled by means of auxiliary hoists and the main gravity sheave.

All machinery is, as far as possible, electrically operated. In the power plant, shown in Fig. 2, are two 200-kv.-a., 220-volt, three-phase, 60-cycle, Ridgway alternators, direct-connected to Ridgway engines. These furnish the power for the entire mine. All the tippie apparatus is operated by means of three-phase, General Electric motors. In the hoist house, at the head of the incline, are two 200-

<sup>1</sup>Note—From the "Engineering and Mining Journal."

<sup>2</sup>Memoir No. 27, Canada Department of Mines.



# Current Coal Literature

The Best Thought Culled from Contemporary Technical Journals, Domestic and Foreign

## Anthracite Coal Freights

The following abstract is made from a series of editorials on the anthracite freight situation, appearing in the *Scranton Times*, of recent date:

It is difficult to conceive of a more desirable class of freight than anthracite coal as it comes to the railroads which center in this region. General freight is delivered to the railroads in boxes and bales, largely in less than carload lots. If it does not constitute a complete carload, it must usually be handled by the railroad at both termini. Much of it is perishable or fragile and subject to damage by accident or wreck. The average carload of freight weighs only 22 tons.

Anthracite coal, on the contrary, comes to the railroads, not in part or full carloads, but in sufficient quantities to make up the burden of a full train. The coal is loaded and unloaded at no charge to the railroad. It requires no station attention. It is neither perishable nor fragile. Even if there is a wreck and the cars are reduced to kindling wood, the maximum loss on the coal is the labor of shoveling it into another car. The average carload weighs about 40 tons.

And yet this easily and cheaply handled commodity, originating in such quantities as to form the major portion of the traffic of, at least, five railroads, the Lackawanna, the Reading, the Delaware & Hudson, the Central Railroad of New Jersey and the Lehigh Valley, suffers the imposition of a high rate, if not the highest rate charged for any commodity.

According to the reports we have, the most extortionate freights on anthracite coal are charged by the Reading railroad, which imposes a tariff of \$1.70 a ton on prepared coal from Pottsville to Philadelphia, a distance of 93 miles, or 1.83c. per ton-mile, while some of the roads of this country carry bituminous coal at one-fifth of that ton rate. We are disposed, however, to tell of the conditions of anthracite coal transportation between the Lackawanna Valley and New York, because we have at hand a recent publication giving accurate figures on the subject. In large part they are from the freight schedules of the railroads themselves.

From this we learn that the rates for transporting coal from Scranton to Hoboken are:

Coal Sizes	Rate	F.o.b.
Prepared coal.....	\$1.58	Hoboken
Pea coal.....	1.43	Hoboken
Buckwheat.....	1.28	Hoboken
Smaller sizes.....	1.35	Hoboken
Lackawanna average on smaller sizes.....	1.13	Vessel

The operators tell us that 60 per cent. of the coal mined is of prepared sizes and 40 per cent. steam sizes. The rate on prepared sizes, Scranton to Hoboken, is 1.089c. per ton-mile. It is shrewdly surmised that the percentage of prepared sizes is greater. But taking the word of the railroad men for it, the average tariff of anthracite coal per ton-mile is 0.837c., while the average tariff on all other merchandise is 0.696c. The cheapest and most easily handled freight is, therefore, rated 25 per cent. or more above the costlier freight, which requires greater care and attention.

The relative earnings of a trainload of coal and a trainload of general freight have been estimated as follows, figuring a \$1.50 rate for prepared coal and \$1.30 for smaller sizes. The load of a coal train is 1670.7 tons, and of a general freight train 504.44 tons, which includes coal loadings of 40.8 tons per car, as compared with an average loading of 22 tons. The haul is 145 miles.

60 per cent. of 1670.7 tons = 1002.42  
40 per cent. of same = 668.28

Hence for a coal train:

1002.42 tons @ \$1.50 per ton = \$1,503.63  
668.28 tons @ \$1.30 per ton = \$868.76

Total earned per train of coal \$2,372.39

For a general freight train:

504.44 tons hauled 145 miles @  
\$0.00696 per ton-mile..... = \$509.08  
Coal earnings per train load exceed  
merchandise earnings..... \$1,863.31

It will thus be seen that the Lackawanna company earns over four times as much on a train of coal from Scranton to Hoboken as on a train of general freight. And the cost of handling is less.

But the discrimination is more markedly shown when comparing the charges for carrying coal and other commodities between Scranton and nearby towns.

All small towns suffer from discriminatory rates, as may be noted from the instances cited above. The most flagrant instance, however, is Montrose, only 49 miles away from Scranton, which pays a

freight rate of \$1.65 a ton on anthracite, or 7c. more than Hoboken, which is 145 miles

RELATIVE FREIGHTS

Freight	From	To	Distance, Miles	Rate
Prepared coal....	Scranton	Moscow	12	\$1.15
Sand....	Moscow	Scranton	12	0.40
Prepared coal....	Scranton	Nicholson		1.50
Wall stone	Nicholson	Scranton		0.40
Prepared coal....	Taylor	La Plume	16	1.25
Manure....	Taylor	La Plume	16	0.56

away. It may be noted here that no independent operator may sell at points along the line. He consequently does not profit in those high prices, being given 65 per cent. of the tidewater price as his sole compensation.

It is quite generally conceded, except by anthracite railroad officials, that the work entailed in the hauling of anthracite coal is about as great as in performing the same service with regard to bituminous coal. But the railroads hauling the latter exact a much lower tariff, as will be seen by the table at the foot of this page.

One has only to compare the rate per ton-mile in this table with the rate on anthracite coal to appreciate the wide disparity between the two.

We do not even have to go to the rates on bituminous coal to prove the discrimination which the coal roads are enabled to impose upon anthracite between the mines and tidewater, by reason of their control of the business. It was only recently that the Pennsylvania R.R. had a rate of 0.520c. per ton-mile on prepared coal from the heart of the anthracite coal regions to Hoboken, against the Lackawanna's rate, 1.089c. per ton-mile for a similar service. When anthracite coal goes beyond the limits of the railroads which produce it, it loses its preferential rate, foregoes the fancy prices and is car-

BITUMINOUS COAL RATES

Region	Railroad	Destination	Distance	Rate	Cents per Ton-mile
Myersdale.....	B. & O.....	Baltimore.....	215.0	\$1.18	0.549
Myersdale.....	B. & O.....	Philadelphia.....	310.8	1.25	0.402
Myersdale.....	B. & O.....	St. George.....	390.6	1.55	0.396
Pocahontas.....	N. & W.....	Norfolk.....	377.0	1.40	0.371
Thurmond-New River.....	C. & O.....	Newport News.....	418.0	1.40	0.335
Handley-Kanawha.....	C. & O.....	Newport News.....	457.0	1.50	0.328
Marrowbone-Kentucky.....	C. & O.....	Newport News.....	673.0	1.70	0.253
Beach Creek.....	N. Y. C. P. & R.....	Port Reading.....	308.0	1.55	0.503
Beach Creek.....	N. Y. C. P. & R.....	Philadelphia.....	229.0	1.25	0.546
Clearfield.....	Pennsylvania.....	Baltimore.....	242.2	1.18	0.487
Clearfield.....	Pennsylvania.....	South Amboy.....	322.5	1.55	0.481
Clearfield.....	Pennsylvania.....	Philadelphia.....	262.2	1.25	0.477

ried at a rate quite as low as bituminous coal. This is proved by the following table, showing rates from Buffalo westward:

RATES BEYOND FROM BUFFALO  
WESTWARD

To	Distance	Rate	Cents per Ton- mile
Louisville.....	516	\$2.10	0.406
Cincinnati.....	446	1.50	0.336
Cleveland.....	183	0.85	0.464
Indianapolis.....	466	1.60	0.343
Terre Haute.....	593	2.00	0.337
Ft. Wayne.....	403	1.50	0.372
Logansport.....	478	1.75	0.366
Peoria.....	650	2.00	0.307
Detroit.....	151	1.00	0.662
Toledo.....	296	1.00	0.337

It has been truly said that there has never been an increase of wages by which the coal-carrying companies do not profit. The passing along to the consumer of the cost of a 10 per cent. advance in wages will add to the public coal bill about \$25,000,000 a year, of which about \$15,000,000 will go to the miners and \$10,000,000 to the big corporations, to swell present satisfactory gains, if the present system continues to prevail.

The statements which follow show not only how prosperity has accrued to the anthracite coal roads since 1899, but how this prosperity has not been duplicated in other Eastern roads not participating in such traffic.

#### STOCK PRICES OF EASTERN RAILROADS

##### ANTHRACITE ROADS

	Mar- ket Value 1899	Div. 1899	Mar- ket Value 1912	Div. 1912
Delaware, Lackawanna & Western.....	194	7 $\frac{1}{2}$	560	20 $\frac{1}{2}$
Delaware & Hudson.....	125	7 $\frac{1}{2}$	175	9 $\frac{1}{2}$
Lehigh Valley.....	30	0 $\frac{1}{2}$	186	10 $\frac{1}{2}$
Reading.....	25	0 $\frac{1}{2}$	164	6 $\frac{1}{2}$
Central of New Jersey.....	126	4 $\frac{1}{2}$	357	12 $\frac{1}{2}$
Lehigh Coal & Navigation.....	91	4 $\frac{1}{2}$	180	8 $\frac{1}{2}$

##### OTHER RAILROADS

	Value 1899	Div. 1899	Value 1912	Div. 1912
Pennsylvania.....	142	6 $\frac{1}{2}$	123	6 $\frac{1}{2}$
New York Central.....	145	5 $\frac{1}{2}$	110	5 $\frac{1}{2}$
N. Y., N. H. & H.....	222	8 $\frac{1}{2}$	136	8 $\frac{1}{2}$
Boston & Maine.....	215	6 $\frac{1}{2}$	100 $\frac{1}{2}$	5 $\frac{1}{2}$
Baltimore & Ohio.....	85	2 $\frac{1}{2}$	106 $\frac{1}{2}$	6 $\frac{1}{2}$
Boston & Albany.....	282	8 $\frac{1}{2}$	220	8 $\frac{1}{2}$

It will be readily admitted that the railroads above mentioned are standard roads, operating in the same part of the country as the coal roads, and most of them touching more and larger towns with better chances to get more general freight and passenger traffic than the coal roads. Yet with a single exception the quotations for shares are very much lower in 1912 than they were in 1899, while the coal shares have made a marvellous increase. The one exception in which the quotation of shares of the other roads is greater than in 1899 is the Baltimore & Ohio. Its prosperity may be attributed to the fact that in the year 1903, the Baltimore & Ohio purchased more than \$30,000,000 of the stock of the Reading R.R., when it ranged in price from 33 to 50, and has ever since been enjoying a return approximating 18 per cent. on its cash in-

vestment. So that even this showing of prosperity comes from anthracite coal.

Perhaps a table showing the value of these great properties in 1899, and their value in 1912, as shown by the stock quotations, together with the increase between these two years, will more impressively bring to the average reader an idea of the magnificent gains that have come to those fortunate owners of anthracite coal and the railroads which transport it.

It will be seen that, though, during the last 12 years there have been mined from the lands of these companies some 700,000,000 tons of coal, which is gone for-

and yielding 10 per cent. dividends. With these included, the total would be considerably sweilded.

#### Electricity in British Mining

In a paper on the use of electric power in the working of coal mines, read before the Manchester (England) Geological and Mining Society, Charles D. Taite said that the aggregate horsepower supplied to collieries in Lancashire by the Lancashire Electric Power Co. is at present about 3000, and this will shortly be increased by work in hand to about 4000.

#### INCREASE IN VALUE OF RAILROAD PROPERTIES

Railroads	Value 1899	Value 1912	Increase
Delaware, Lackawanna & Western.....	\$ 50,828,000	\$169,551,200	\$118,723,200
Delaware & Hudson.....	53,000,000	74,200,000	21,200,000
Lehigh Valley.....	12,000,000	112,720,880	100,720,880
Reading.....	35,000,000	229,600,000	194,600,000
Central of New Jersey.....	34,569,363	97,749,376	63,180,013
Lehigh Coal & Navigation.....	17,290,000	47,804,210	30,514,210
Totals.....	\$202,687,363	\$731,625,666	\$528,938,303

ever, and on which the corporations have their profits, the aggregate value has increased more than threefold. The Lackawanna R.R. is looked upon as a phenomenon, but it has increased in value only a little more than threefold, while the Reading has increased sixfold and the Lehigh Valley ninefold. The Central Railroad of New Jersey shows almost a threefold increase. The only new money put into any of these corporations is \$20,000,000 into the Lehigh Valley and something over \$2,000,000 into the Lehigh Coal & Navigation Company.

The amount of dividends paid by these corporations during the 12 years from 1899 to 1912 is also a matter of interest in connection with this subject. The cash dividends only are shown in the following table:

#### DIVIDENDS DECLARED, 1899 TO 1912

Railroads	Per Cent.	Total Dividends
Delaware, Lackawanna & Western.....	213	\$57,500,500
Central Railroad of New Jersey.....	100	27,436,800
Delaware & Hudson.....	92	39,008,000
Lehigh Valley.....	53	23,450,473
Reading.....	31 $\frac{1}{2}$	44,100,000
Lehigh Coal & Navigation.....	72 $\frac{1}{2}$	13,775,000
Total.....		\$205,270,773

This does not include the stock dividend of 15 per cent. declared by the Lackawanna in 1909, nor the stock dividend by the same company in 1911 of 35 per cent. in stock of the Lackawanna Railroad of New Jersey, nor of the recently authorized issue of \$12,000,000 additional stock which will probably go out as a stock dividend. It does not include the \$2,000,000 of stock of the Lehigh Coal & Navigation Co. issued at par, nor the 15 per cent. scrip dividend of the same company convertible into stock. Nor does it include the valuable right to stockholders of the Lackawanna and the Lehigh Valley to subscribe at par for \$6,000,000 stock in the respective coal companies, worth more than \$200 a share,

For some reason Lancashire has been slower to adopt electrical methods than other colliery districts. To the mines around Newcastle three power companies are supplying electrical energy at the rate of over 55,000,000 units per annum. In South Wales 12,500 hp. is being taken from the power company's mains, and a further 3500 hp. is contracted for. In the Clyde Valley district about 8500 hp. is either connected up or arranged for, while in Yorkshire the present connections deliver 4000 hp., with an additional 2000 hp. contracted for. Among other machinery using this energy are three electric hoists and three more are to be installed. Possibly the greater age of the shafts has something to do with the backward condition of Lancashire collieries electrically, compared with other British mine installations, but where coal is most difficult to extract the most modern methods are essential in order that the costs may be kept at the lowest possible figure.

The temperature of maximum weakness in a burning briquet is located between the melting point of the binder and the caking of the coal. For use with coals that cake at a high temperature binders must also have a high temperature melting point if they are to give good results when burning. Non-caking coals must be mated with non-melting binders. Starch gives the best burning results with such coals, but it is not waterproof. Soluble binders mean soluble briquets.

Shooting off the solid in bituminous mines is a dangerous and wasteful proceeding; dangerous, in that it is productive of windy or blowout shots which often cause dust explosions, and wasteful because it greatly increases the slack and fine coal, which is useless except where it can be used for coking purposes.



# Who's Who—in Coal Mining

Devoted to Brief Sketches of Prominent Men, Their Work and Ideas

Famed as the home of Joe Cannon, bounded on the north by Lake Michigan and largely underlaid with 6 ft. of fairly decent commercial coal, is the great State of Illinois. Forty per cent. of the entire population staked out their homes on the lake front in a large community called Chicago, which latter town was created solely to supply Marshall Field with a dry-goods market and to furnish consumers of coal for Francis Peabody's City Fuel Co.

More than 800 Illinois coal mines have been opened by some 250 operating companies, which corporations are conducted in the interest of John Walker and 70,099 other miners who have contracted to relieve the owners of all responsibilities in the way of management of the properties; only requiring that the operators make good all working deficits, and be liable in case of accidents due to negligence on the part of an employee.

Out in this broad, flat, Middle West country, it originally cost about as much to open a coal mine as it did to start a corner grocery, and nearly as many people devoted their money and attention to mining as to selling canned goods and fresh vegetables. All the Coal Barons could remember how once upon a time a certain fellow made money mining coal in Illinois, and everyone labored on in the belief that the golden era would return.

Even the miners caught the fever, and four or five dozen coöperative coal companies were formed to develop that field lying across the river from St. Louis. However, when the supposedly huge profits that had been flowing into the coffers of the individual owners were divided up among the "producers of the wealth," there wasn't enough to go around, and failures came with greater regularity than dividends. But hope dies hard, and always there were those who were willing to repair the wreck and benevolently carry the work forward.

It is from great ruins that noble structures rise, and before many years have passed the coal industry in Illinois will be placed on a sane and satisfactory basis, and owner, miner and consumer will profit thereby. One of the men who will help bring about the new order of things is C. M. Moderwell, of Chicago, president of the United Coal Mining Co., and a man of force and vigor.

Mr. Moderwell is a native son of Illinois, having been born in Geneseo in 1868. His early training was secured



C. M. MODERWELL

in the high school of his home town. Following this preliminary education, he went to Wooster, Ohio, where he finished a general course in the University of Wooster, a Presbyterian school.

Having completed his theoretical training, Mr. Moderwell secured employment in Chicago, working for a railway association and devoting his attention and time to the Bureau of Joint Rate Inspection. In 1892 "C. M." became connected with the coal business, serving as a clerk in the office of the Montana Coal & Coke Co., a West Virginia concern controlled by the Watsons of the latter state. Three years later he was appointed Western sales agent for the West Virginia company, and served in this capacity until, in 1902, he entered business for himself, forming the National Coal & Coke Co., a corporation designed principally to do a jobbing business.

In 1905, when H. B. and W. P. Utley, partners in the business, retired from the firm, Mr. Moderwell formed the C. M. Moderwell Co., still doing a jobbing business. This same year he obtained options on a considerable coal acreage in Franklin County, Illinois, and commenced operating this tract under the name of the United Coal Mining Co. At the same time the C. M. Moderwell Co. continued to handle other coals than those produced by the United company, until at the present time "C. M." has built up and

supplies a market of considerable importance.

A new mine that has just been opened by the United Coal Co. at Christopher, Ill., is properly conceded to be one of the most modern and best equipped properties in the state. The same company also has a small mine in Indiana, at Mecca in Parke County.

Although Mr. Moderwell does not control a great number of mines and an unusually large production, he certainly "cuts a lot of ice" in the councils of the Illinois coal operators. At the recent meeting of the Mining Congress in Chicago he and Carl Scholz were the leading spirits in effecting arrangements for the conference, and the success of this most recent meeting was largely due to his efforts.

Mr. Moderwell firmly believes that conditions in the coal industry in Illinois are certain to get very much worse before they finally improve. Like other men who are well informed as to the true situation in that state, he attributes the present unsatisfactory conditions to the lack of a united front and common understanding on the part of mine owners. "C. M." points out that consolidation is the probable cure, and cites the case of Indiana where six companies control about 75 per cent. of the output.

Due to suicidal competition, Illinois mines last year worked only 182 days, and there is little hope of a betterment in the situation until a few powerful interests have secured control of affairs. The miners themselves, notwithstanding the fact that they have forced greater concessions from owners in Illinois than from operators in any other state, have failed to profit through their seeming victories, for last year the average wages of each mine employee working in one of the collieries of the state was less than \$600.

As to sociological work among the miners, Mr. Moderwell holds ideas that are ultra-modern, and he firmly believes that mine owners are often prevented from carrying out a definite plan of welfare work by the unnecessary suspicions of the men themselves. It frequently occurs that an operator is prevented from effecting an improvement at his mines, because of the belief on the part of many employees that there is a "nigger in the woodpile." War has been waged so long in Illinois that the miner cannot realize that the "enemy" may have an unselfish interest in his erstwhile foe.



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*This journal has a direct aim—a single purpose—which is to help advance the coal-mining industry. Its creed embodies the dissemination of knowledge and the free interchange of ideas among its readers, all of whom are invited to become regular contributors.*

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# COAL AGE

## Mining Methods and Labor

There is but little opposition today to the introduction of machinery in coal mines. The American workingman takes quite a sane view of its use, and realizes that it increases his earnings and lightens his toil. It is remarkable the change in view which has taken place even in the last decade, for there are few workmen at present who seriously entertain the foolish notion that machinery impoverishes labor. Yet a certain amount of education on the attitude of labor to machinery is needed, and it is not unreasonable to hope it will be effected if sober counsels prevail.

The average miner who works with or after machinery has altogether too much hard lifting and pushing to do. The work referred to is not continuous, but it is hard. The machinery is cumbersome and not much of it is equipped so as to be self-propelling. A common type of machine has to be loaded on a truck, with perhaps a board, flexible hose and other paraphernalia. It has to be pushed to the face of a long room and disembarked. The board is placed and the machine dragged onto it and a sumping cut is made. After a few straight cuts are completed, the machine and board must be pulled back across the face and reloaded, and the truck with its load pushed down the room and up along the heading to the next chamber, ready for cutting. Then all the work detailed has to be duplicated in another room. With machines of other types, the methods are but little different and are often still more laborious. It is to be hoped for the sake of the miner that much of this hard work will be eliminated.

All these difficulties are faults, not of the machines but of our disjointed methods of mining. In many cases, they are the outcome of the room-and-pillar method. This latter plan never was a thoroughly satisfactory system, and the advent of the machine has only made it increasingly undesirable. The more a single cutter will accomplish, the more un-

desirable it is to provide such meager opportunities for its action.

Gradually we are learning how the many roadways needed for approaching a multitude of working faces makes it hard to maintain any one road in proper shape. Little by little we are grasping the idea that more powder is consumed and more danger incurred when shooting in a tight place. Slowly it dawns on us that the multiplicity of roadways excludes the use of a large car in a thin bed. We are beginning to realize that this old method makes necessary excessive supervision and much work for shotfirers, ribbosses and timbermen.

Moreover, we are commencing to see how hard it is to ventilate the ragged line along which the coal is attacked. Valuable fuel is being lost and the difficulties of drainage and general development are multiplied. We are feeling our way to a point where we shall deplore the inability to use machines for shoveling and conveying.

Hampered in every direction, as in the distribution of power (knowing that one machine will work only from one-third to one-half time), we buy grudgingly, enough cutters to mine the needed coal, but we rarely arrange for sufficient power to operate all the machines at the same time. At least we do not purchase pipes or leads large enough to permit of synchronous working of the machines. So now and then we find a scarcity of power.

But if the machines could cut all the time on a longwall face, this difficulty and all the others would disappear. Our territory would be more compact, more readily supervised, better timbered, piping and wiring costs would be lessened, the ventilation would be better, the coal more easily shot, new types of machinery could be used, large cars loaded and more work done per man employed. Drivers and motormen would not be delayed by the transference of machine trucks along the haulage roads and larger coal would be obtained. Moreover, in thin beds, which now have wide rooms, a double shoveling of coal would be unnecessary. It is true

that the longwall workings of English mines have the disadvantages of high timbering costs and of that increased expense which results from continued road renewals, but the retreating-longwall-by-panels system, now in use in a few American mines, should not involve any of this expense.

However, if the wage rate to the cutter per ton undermined is to be as high on several small working faces as on a long cutting face, if the payment of the loader per ton removed is to be the same whether much or little powder is consumed, and whether conveyer machines are used or not, then every change which benefits labor is to be at the entire expense of capital, and the latter will make no move.

There must be on the part of labor a desire to hasten the introduction of every form of machinery and a willingness to share fairly in the product of lessened effort. The worker must be willing to concede a fair proportion of the advantages of a scheme which lightens his labor and makes possible a greater output per day, seeing that the improvement will be brought about by the expenditure of no little money. The miner should be ready to welcome the opportunity afforded him, not only to make a greater daily wage, but also to work less hard and should not wish to monopolize the just dues of commercial enterprise. Otherwise the cutter, scraper and loader will continue to act as boosters and as mules, and will be delayed and harassed in their work by ill adjusted conditions.

As conditions in unionized districts now exist, it does not seem advisable to adopt elaborations requiring expensive machinery of unusual type, and a reconstruction of the mines with a sure increase of dead work and extra day labor, if the share of the operator in the proceeds is only what can be obtained from the use of a somewhat larger car and the obtaining of somewhat less broken coal. Where coal is weighed before screening, the obtaining of large lumps might alone justify the new methods of working and the introduction of machinery appropriate thereto, but where payment is based on the screened product, it is hard to see what important gain the operator could make unless he received a concession in wage. The use of the face conveyor involves the hiring of car loaders, machinists, engineers and firemen, and as these men all assume a part of the work of the

loader, it is but right that a reduction of loading price, not necessarily proportionate, however, should be conceded by him; but always, on the condition that under the new arrangement he shall be assured a chance to earn a better wage than under the old *régime*.

### The Pittsburgh Rate Case

We have refrained from commenting on the decision of the Interstate Commerce Commission, rendered in the Pittsburgh-Lake rate case, until a careful analysis of the text of the verdict could be made. This decision, in its effects on the coal industry, is by far the most important ruling yet made by this court. It is broad in scope, conclusive in its results, conservative to a fault and, most important of all, will become effective almost immediately without further litigation.

We are firm advocates of an equable geographical distribution of the coal markets, and believe that any principle by which the railroads attempt to increase their tonnages or excite unprofitable competition by the imposition of unfair tariffs, is directly contrary to the basic intent of our Constitution. In the opinion of the Commission it was the intention of the railroads to promote such conditions by gradually advancing the Pittsburgh rate, "not to bring it up to the level which the carriers might have regarded and defended as reasonable, but to let certain competing coal fields into the lake trade." This disposition on the part of the railroads to be the ruling factor in the destiny of any coal field is a distinct imposition on the industry and one long resented by it.

The ruling provides, in brief, for a reduction in the Pittsburgh rate of 11 per cent. and an increase in rates from the Thacker and Pocahontas fields averaging 9 per cent., making a differential on the existing schedule of approximately 20 per cent. What the real material benefits, accruing to the Pittsburgh operators will amount to, is problematical. As is well known, the Fairmont and Kanawha fields are the most important competitors in the lake trade and no revision in rates from these districts has been made. On the other hand, it is estimated, on the basis of past shipments from the Pittsburgh district, that the reduction will effect a direct saving to the

operators of over a million dollars annually. Aside from this, many mines heretofore unable to ship profitably to the lake market will now be in a position to compete actively in this trade. That the ultimate effect will be a marked change and a radical readjustment in long established channels of commerce, is hardly to be questioned.

A careful analysis of the findings of the Commission shows a decided (and commendable) leaning toward conservatism. While the court is of the opinion that on the basis of a ton-mile rate, the differential should be even greater, it says, in part:

When we consider the disturbance in established differentials, the possible deflection in the currents of coal trade and the effects on the carriers directly involved, we are forced to the conclusion that a rate lower than this would not be just.

And from the further fact that the ruling is made effective only over a period of two years, shows the tentative way in which the Commission regards its finding, and the possibilities of a reversal should it fail to bring forth the desired results.

Dissatisfaction with the decision of the Commission has been expressed in some quarters. There are those who point to the Pittsburgh rate of 5.5 mills per ton-mile as compared with the Kanawha rate of 2.4 mills and believe that the revision should be made on this basis. Railroad tariff is a question which has occupied the attention of some of the keenest intellects in the country, and a solution of the problem along these lines has been generally conceded impossible. When it is remembered that the rate on a carload of steel plates from Pittsburgh to Chicago is nearly double that on a carload of pianos from New York to Chicago, the utter absurdity of such a contention is at once evident.

The foreman is the chief factor in the prevention of mine accidents. On his personality depends the discipline of the mine. In order to fulfil all the requirements of the ideal foreman a man should have had practical experience in mining, good judgment, enough initiative and strength of character to stand by his ideas and make others respect them. He should possess sufficient tact and knowledge of human nature to control the men under him, and be temperate and truthful.



# Colliery Notes and Comments

Practical hints gathered here and there, and condensed to suit the busy reader

The Appalachian coal field is the richest coal deposit in the world. It produces nearly one-third of the world's coal.

Lethbridge and the Pass district produced over 6,000,000 tons of coal last year. Fifteen years ago the same region produced less than 200,000 tons a year.

A succession of small shots is much better than a few large ones. Holes should be drilled so that advantage may be taken of all partings. Load the coal out before firing a second charge.

A Scotch device for removing dust from coal mines consists of electrically-worked air-jets and a suction-device which simultaneously raise and withdraw the dust.

Experience has shown that the wet zone method of preventing the spread of an explosion is not to be depended upon. With very intense heat, thoroughly wet zones, 150 ft. long, have been crossed by the flame.

A method of removing carbonic dioxide sometimes employed in English mines, is to spray the mine with hypochlorite mixtures in liquid form. The hypochlorites of the alkalies have the property of absorbing carbonic dioxide when such is present.

Experiments made in France have shown that watering thoroughly for 10 yards in front of shot holes in dusty mines will greatly reduce the dangers resulting from blowout shots. While ignition was not always prevented, it in no case extended more than seven or eight yards.

Precautions to prevent gob fires are: (a) So far as is possible, withdrawing all timber from the gob; (b) stowing the waste with all the dirt available; (c) giving great attention to the building of gate-side pack-walls; (d) leaving no pillars or ribs of coal; (e) keeping the workings cool by means of ventilation, but excluding the air from the gob.

Leaders of rescue corps should bear in mind that while rules and regulations are desirable for intelligent action, it is impossible to lay down hard and fast rules for rescue work at explosions and mine fires, as circumstances vary and each mine and each fire or explosion furnishes a different problem in itself, and nothing can replace individual intelligence and decision on the part of the leader of the corps.

Developments in mining, in Alberta province, Canada, during the past five or ten years, have produced great changes. Seven large and well equipped collieries now dot the plains, and some of these are said to have the most up-to-date steel tripplies in the world. There has been, in this time, a vast development of coal areas in the "Pass," known better as the Crows Nest Pass, on the C. P. Ry., and on the line dividing the provinces of Alberta and British Columbia.

Pure calcium chloride will absorb as much as 1.15 times its weight of water. When intended for use on dusty roadways, gobs, or floors of entries, it should be bought in the granulated form as it is then much easier to spread evenly and is more effective than when either in the solid or dissolved form. But for use on ribs, roof, and timbers five or six pounds should be dissolved in 100 lb. of water and this mixture sprinkled by means of the water car and hand pump.

Discussing the types of available breathing apparatus, Mr. Blackett says there are two forms from which to choose, namely, (a) that which maintains its supply of oxygen from steel cylinders containing the gas compressed to, say, 120 atmospheres, and which has the expired carbonic-acid gas absorbed by such a substance as caustic potash, and (b) that which depends upon liquid air boiling off and being discharged into the surrounding atmosphere, instead of being, as it were, regenerated.

Spontaneous combustion is now recognized as the greatest problem to be overcome in connection with the storage of bituminous coal. One good method of detecting an incipient fire is to have all storage bins fitted out with temperature tubes, using 4-in. galvanized pipes, about 20 ft. long, set in the floor of the bins in such a manner as to project upward into and through the coal pile. Each tube should be provided with a thermometer which is capable of indicating temperatures over 150 deg. F. Run a circuit from each of the tubes to an alarm bell in the office of the yard superintendent so that if the coal is heating an alarm will at once be sounded.

Great Britain has no law touching the kind, or length of service of hoisting ropes. The law limits itself to holding the mine owner personally responsible for any mistake he may commit which

results fatally, but so far as the law is concerned any kind of rope may be used and may be kept in use as long as the mine management desires. Superintendents are obliged to report all rope breakage regardless of whether any persons were either killed or injured. In the last 10 years Great Britain has had only 38 fatal accidents due to the breakage of hoisting ropes. Only a few British mines test their ropes themselves; the tests are made by the rope manufacturers. It is far less customary to test the finished rope than the individual wire.

Prussian mining authorities prescribe the following tests for hoisting ropes used in shafts where men are lowered and hoisted. Each rope must be subjected to tensile and bending tests performed on a 40-in. length cut from the rope. The tests must be applied to each wire in the rope, except the core wires of the several strands and of the entire rope. Each wire must be loaded to its breaking point and its limit of flexion must be ascertained by bending it through an angle of 180 deg., on a 5mm. (0.2 in.) radius until it breaks. The number of bends must be counted. Each test for flexibility is carried out by bending the wire alternately from right to left, through an angle of 90 deg. from the vertical to the horizontal position and on to the vertical position. The carrying power of the whole rope is calculated by adding together the weight required to break each individual wire, with the exception of the cores, leaving out of consideration all wires whose carrying strength is 20 per cent. below the average of the whole. Ropes made of wire, other than plain section must have their carrying power determined by straining the whole rope or whole strands to the breaking point. All hoisting ropes must be tested at least once every three months. When the strain on the rope is light, longer intervals may elapse between testings, by cutting off at least 10 feet from the end attached to the cage, above the capping; 40 in. of the top part of the cut-off portion must be tested for tensile strength and resistance to flexion in the same manner as prescribed for new ropes. Every hoisting rope must exhibit at least a margin of safety of 6, referred to the maximum load carried when hoisting animals. When hoisting men the weight on the cage must not be more than  $\frac{1}{2}$  the weight carried when hoisting coal.



# Discussion by Readers

Comment, Criticism and Debate upon Previous Articles, and Letters from Practical Men

## Spontaneous Combustion

Under the above caption much has been written and said by many experts and scientists. Yet it seems there are a few practical things picked up in a life's experience around mines, that might be said. The reason some coals ignite without the application of fire, and others do not, is as mysterious and paradoxical as the coking qualities of coal.

Most writers agree that iron pyrites (FeS) is the principal cause of spontaneous combustion, but I do not agree with this theory. Although the bisulphide of iron is always found in gob fires, I have always understood that no fires have ever taken place in coal piles or gobs except where proto sulphides were also present, as for example in the Yorkshire and South Wales tests. This is true at least, in all cases where these gobs and coals have been subjected to ultimate analysis. Also, quite a number of experts do not seem to distinguish between the gases that compose the coal and those occluded in it.

Furthermore, few people have considered the nature of these occluded gases sufficient to thoroughly understand the origin of the gob fire. Most writers seem to infer that the temperature of spontaneous combustion is quite high, about 700° to 1000° F.; to this again I cannot agree. Many men who have traveled over gobs and the waste in abandoned workings have no doubt noted the extra heat of the top coal, slack and bituminous slates.

This, I understand, to be spontaneous combustion in its initial stage; it may be as low as 80° F. or so hot you cannot hold your hand on it, yet the actual fire is not yet due by many degrees. It seems possible that, in the disintegration of the coals, enough heat is generated to throw off one S from the FeS<sub>2</sub>, thereby forming the proto-sulphide FeS and SO<sub>2</sub>. At any rate I am positive, there is plenty of this sulphurous oxide generated long before any glowing fire appears.

Your correspondent stated that water or vapor helped the combustion and it may be the HO is given off, and with the free S forms the SO<sub>2</sub>. However, I do not think so, as it always has been my experience that the drier the gobs the more liable they were to fire, and I have never seen a fire in a wet gob. But to return to the temperature, I believe that when combustion has advanced enough to produce large quantities of SO, it may be stopped and the temperature made normal.

I firmly believe that, if waste workings were thoroughly ventilated, there would be no gob fires. At our mines here four years ago we holed a butt heading out to daylight. On the rise side of this heading was old workings about 2000 ft. by 1500 ft., all abandoned; through this heading we hauled the coal from another mine by electric motors. The mine inspector and I had often noticed the dry SO<sub>2</sub> coming along this haulageway in the suction of the trip; there was enough to make you cough and sneeze. Beyond these workings there was a large block untouched, which it became necessary to develop. We discharged into the old workings 35,000 cu.ft. of air per min., as per the state mine inspector's report. The result is that the pungent odor is gone, and the old entry that once fatigued you, and made your eyes ache in a 1000-ft. travel can now be traveled with impunity.

Therefore, my firm opinion is, that the cause of the most of the spontaneous ignition in mines is principally the lack of proper ventilation. I have such faith in the theory that I have recently suggested a plan to ventilate coal stock-piles.

JOSEPH VIRGIN.

Plymouth, West Va.

[Our correspondent has presented some interesting, and we believe original theories, on this much discussed question. He has, however, evidently been misinformed or been referring to unreliable authorities. The most recent investigations on this subject are embodied in a paper presented by permission of the Director of the U. S. Bureau of Mines at a joint meeting of the New York sections of the American Chemical Society, American Electrochemical Society and the Society of Chemical Industry, New York City, Nov. 19, 1911. On the subject of spontaneous combustion this paper says:

Oxidization (probably in the main an absorption of oxygen by unsaturated chemical compounds) begins at ordinary temperature in any coal, attacking the surfaces of the particles and slowly developing heat. In a small mass of coal this heat can readily dissipate itself by radiation and no rise in temperature results. If radiation is restricted, however, as in a large pile densely packed, the temperature slowly rises. Now, the curve of oxidation rates, plotted against temperature, rises with great rapidity, and when the storage conditions are such as to allow the temperature of about 100° C. to be exceeded, the rate of oxidation is great enough ordinarily, so that the heat developed overbalances the heat radiated. Then the temperature rises to the ignition point if the air supply is adequate.

According to this hypothesis, spontaneous combustion is accelerated by the exclusion of air until the temperature of 100° C. is reached, after which combustion is aided by the admission of air. We would be pleased to hear from other readers on this very important subject.—EDITOR.]

## Testing for Gas with a Normal Flame in the Wolf Lamp

In my experience with a Wolf lamp burning naphtha, I have observed that when a  $\frac{3}{4}$ -in. or normal flame was used for testing purposes the lamp would not give any indication of the presence of gas, except that the flame became somewhat smoky. In one instance, recently, there was a uniform mixture of  $3\frac{1}{2}$  to 4 per cent. of marsh gas in the air at the time of making the test. In using the normal flame, I could get no indication of gas. When the flame of the lamp was reduced, however, to what may be called a standard or capping flame, a  $\frac{3}{8}$ -in. to  $\frac{1}{2}$ -in. cap was formed. I would like to know if others have had the same experience in the use of the Wolf lamp.

After studying the matter, I came to the conclusion that the air or mixture of air and gas, which entered the lamp through the gauze ring below the flame, was only sufficient to support the flame and burn a very small amount of gas that acted to keep the height of the flame constant. My idea was that when a larger flame was used, the air entering the lamp was not sufficient to produce complete combustion, which fact caused the smoky appearance of the flame; and this, together with the brightness of the large flame, obscured the cap. It is a common practice among some firebosses to test for gas with the normal flame in the Davy lamp; but this lamp has a large intake area providing a better circulation in the lamp than is true for the Wolf lamp. When using the normal flame in testing for gas, to obtain reliable results the flame, in gas, should reach to the top of the globe, in the lamp, or nearly so. To determine the percentage of gas, however, a reduced or standard or capping flame should be used.

BENJAMIN HARTILL.

Johnstown, Penn.

[In this connection, the article "Estimating Gas Percentages," COAL AGE, Dec. 2, p. 250, is of interest.—EDITOR.]

# Inquiries of General Interest

All Questions Must be Accompanied by Name and Address—Not for Publication

## Motive Column and Velocity

I want to ask (a) what will be the height of motive column produced by the difference of temperature in two shafts of equal depth and area, the depth of each shaft being 700 ft.? The temperature of the downcast is 40° F. and that of the upcast 65° F. (b) What would be the velocity of the air current?

INQUIRER.

(a) The height of motive column depends only on the difference of temperature in the two shafts, the density of the air and the depth of the shafts. The area does not affect the motive column. The upcast air being the lighter, a motive column of this air will be longer, for the same conditions, than a column of the heavier downcast air.

Downcast air

$$M = 700 \times \frac{65 - 40}{460 + 65} = \frac{700 \times 25}{525} = 33\frac{1}{3} \text{ ft.}$$

Upcast air

$$M = 700 \times \frac{65 - 40}{460 + 40} = \frac{700 \times 25}{500} = 35 \text{ ft.}$$

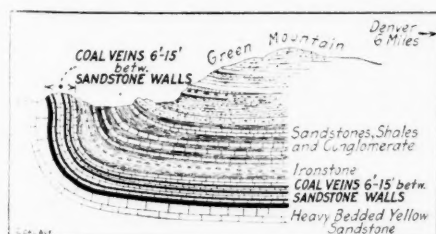
(b) The theoretical velocity due to the head of air column in either case is given by the formula

$$v = 1 \sqrt{2gh} = 1 \sqrt{2 \times 32.16 \times 35} = 47.4 \text{ ft. per sec.}$$

This, however, has no practical bearing, here, as it represents the rush of upcast air into a vacuum only; and has nothing whatever to do with the velocity of the upcast current in the shaft.

## Thick Vertical Coal Seam

I was greatly interested in the inquiry of Chas. M. Sherman, COAL AGE, Apr. 6, p. 851, asking for a discussion of the best method of developing a vertical coal seam, 16 ft. thick, 1000 ft. deep and



GEOLOGICAL CROSS-SECTION OF COAL SEAMS

one mile long. This is a pertinent question and one we also would like to see discussed, inasmuch as we are facing a similar proposition here, having just opened a vein that could be described in

the same words. At the present writing, we have sunk a 5x8 ft. prospect shaft, 110 ft. deep, and from the bottom of this shaft have driven entries, each way, 300 ft., in the coal. The seam measures 16 ft. thick and stands at an angle of about 87°; it extends downward fully 1000 ft. and has a width of 2 miles on the property.

We shall watch with much interest the replies to this question. We inclose a sketch showing the cross-section of the formation here, taken from the report of the Geology of Colorado Coal Fields.

W. B. HOUSE, GENL. MGR.

The Rooney White Ash Coal Co.  
Denver, Colo.

## Detection of Carbon Monoxide Gas in Mines

Among the questions answered in COAL AGE, Mar. 9, p. 720, I notice one asking how to detect mine gases, or rather, to describe the effect of the different mine gases on the flame of a safety lamp.

I would like to ask if the manner in which this gas is commonly described, especially with regard to its action on the flame of a lamp, is not a dangerous and misleading way of putting it. All text books, in speaking of carbon-monoxide gas, refer to the lengthening of the flame in the gas and add, the flame burns more brightly in this gas than in air. This must be true since all books on mining say the same thing; but they do not give the percentage of gas necessary to produce this effect. My question is, does not this statement lead the miner to depend upon his lamp to show this gas and often cause him to lose his life in the attempt to rescue friends, after an explosion?

If I am not mistaken, it takes 3 per cent. of CO to show this effect; but 1/2 of 1 per cent. of this gas is fatal to life. If this be true, a man would die before his lamp would reveal the danger. I do not wish to be understood as a critic, but I have seen foolish men lose their lives in the manner stated, depending on the light to show this gas. It may have been because of the books they had read; but I think this matter should be made clear by an article on this gas alone, especially as so few miners understand the danger to which they are exposed in its presence.

JAMES R. CAVANAUGH.

State College, Penn.

Our correspondent has drawn attention to an interesting and important point. While it is probably true that more has

been written, of late, drawing attention to the dangerous character of this gas than can be said of any of the other mine gases, much of what has been written is misleading in the daily practice of mining, because undue emphasis has been placed on the physical properties of the gas, the effects of which, in most cases, are not understood by the ordinary miner.

The answer to the question to which our correspondent refers, however, in COAL AGE, Mar. 9, p. 720, distinctly states: "However, it is unsafe to rely wholly on these indications for its (CO) detection. Other means should be used, as the blood test or the canary or mouse test." The answer to the question immediately preceding this one draws attention to its dangerous character, which is due chiefly to the fact that lamps "continue to burn brightly in the presence of this gas".

In regard to the percentage of gas required to produce the effect described, it is impracticable to say; because, the gas being combustible, its presence in the air surrounding a flame adds to the combustion and maintains a higher temperature over the surface of the flame. A very small percentage of the gas increases the brightness visibly, and the effect is greater as the percentage of gas is higher. Just at what point the effect becomes appreciable depends on the quickness of the observer to detect the change.

Furthermore, the presence of fine coal dust floating in the mine air will produce the same effect, lengthening and brightening the flame, when no carbon monoxide is present except that which may be generated by the burning of the dust in contact with the flame. On the other hand, the presence of blackdamp destroys the effect of carbon monoxide on the flame more or less completely, while it does not, to the same extent, destroy the toxic effect (effect on life).

For these reasons the effect produced by this gas on flame, as commonly described, though true for even low percentages, must not be taken as a safe guide or test. The same remarks apply, though less forcibly, to the detection of firedamp, the flame test being modified here also by the presence of other gases. A dangerously explosive mixture of marsh gas, carbon dioxide and air (flash-damp) is frequently mistaken for a harmless body of gas or overlooked entirely, because the cap only appears as a momentary flash on the lamp and is gone.



# Examination Questions

Selected from State Examinations, or Suggested by Correspondents

## Ellsworth Mining Institute, Tennessee

### MINE FOREMEN'S CLASS, QUESTIONS

**Ques.**—Describe, in a general way, the duties of mine foreman, superintendent and all other employees inside of a mine.

**Ans.**—The mine foreman is the responsible man in the operation of a mine. He has full charge of the mine, its equipment and supplies. His duties are to direct and supervise the entire work of the mine, examine and control its ventilation, inspect all machinery and the inside workings, provide the necessary supplies and receive the daily reports of the men in his charge. He must personally superintend the prompt removal of all known dangers or order the men to withdraw from the mine.

The superintendent plans the work, receives and files all daily and monthly reports, fills all orders for supplies made by the mine foreman, inspects the mine maps, time sheets and all bills of expense, directs the loading and shipment of coal, and regulates the output to meet the demand.

The fireboss examines the mine for gas and to discover any dangers or unsafe conditions before the men enter the mine in the morning and during the day while the men are at work in their places. He should place danger signals where such are needed, give all necessary instructions to miners, regarding the use of their lamps, the drilling of holes for blasting, charging and firing shots, and the timbering of their places, loading of cars, and whatever may be necessary to safeguard life and property.

The boss driver directs the other drivers in the work of transporting the coal from the working face to the parting or shaft bottom. The timbermen and trackmen look after the timber and track in all roadways, take down loose rock and lay room switches as these are required.

It is the duty of miners to carefully inspect their own working places and set any timber that may be required before starting any other work. All employees should report promptly any dangers they may find to the mine foreman or his assistant.

**Ques.**—What quantity of air is passing in an airway 5x7 ft. when the velocity is 250 ft. per min., and what record should be made in the mine-record book of such measurements?

**Ans.**—The area of the airway is  
 $a = 5 \times 7 = 35 \text{ sq. ft.}$

The quantity of air passing is then  
 $q = av = 35 \times 250 = 8750 \text{ cu. ft. per min.}$

The date of the observation, sectional area of the airway, anemometer readings, velocity of the current and the calculated quantity of air passing should all be promptly recorded in the book kept for that purpose and the entry signed by the one who made the observation.

**Ques.**—What is meant by splitting the air current in a mine, and what effect has it on the total volume of air in circulation?

**Ans.**—By splitting the air in a mine is meant dividing the air current into two or more separate currents. By this means the total volume of air is increased, assuming the power producing the circulation remains unchanged. Owing to this increased volume of air having to pass through the fan, the shafts and the main airways, its velocity in each of these is increased in proportion to the increased volume of air, but the velocity in each of the splits is decreased somewhat. However, owing to the number of splits the total quantity of air in circulation is always increased.

**Ques.**—If a current of 30,000 cu. ft. of air is passing into a mine and you find only 5000 cu. ft. at the working face, how would you account for this loss and how can it be prevented?

**Ans.**—The loss in the volume of air that reaches the working face is due to leaky stoppings, doors, air bridges and brattices used to conduct the air throughout the mine. If these are not made airtight the current or a certain portion of it will be short-circuited at such points and pass into the return, thus failing to reach the face. It can be prevented by repairing or rebuilding all stoppings, doors, brattices, etc., that leak air.

**Ques.**—If an airway 2000 ft. long and 6x8 ft. in section is passing 50,000 cu. ft. of air per minute, and another airway of equal size is added, what will be the total quantity of air passing per minute in the two airways, the pressure remaining constant?

**Ans.**—The question is a little indefinite as to its meaning. Assuming, however, that the airway added is another and separate split affected by the same pressure as the original airway, the total quantity of air will be doubled, since each airway will then pass 50,000 cu. ft. per min.

On the other hand, if the new airway is an extension of the original airway, whose length will thus be doubled, the quantity of air that will then pass through this long airway will be decreased. For the same pressure per square foot the quantity varies inversely as the square root of the length. More simply, for the same pressure, the quantity ratio is equal to the square root of the inverse-length ratio (the cross-section of the two airways being the same). Thus, the length ratio in this case being 2, and calling the required volume of air  $x$ ,

$$\frac{x}{50,000} = \sqrt{\frac{1}{2}} = 1/\sqrt{0.5} = 0.707$$

$$x = 50,000 \times 0.707 = 35,350 \text{ cu. ft. per min.}$$

**Ques.**—What provision should be made inside a mine to insure its being properly ventilated?

**Ans.**—All stoppings, brattices, doors and air bridges must be made airtight. Doors must be substantially built and hung so as to close with the air. Double doors must be used at all main points separating the main intake and return airways. Other doors on haulage roads where much coal is passing should be trapped. All air crossings should be built as overcasts and not undercasts. Airways and crosscuts should be kept free of all obstructions of any nature; empty or loaded cars should not be stood in airways, but in the mouths of rooms or on partings where they will not obstruct the flow of air. The air current should be distributed so as to proportion the quantity of air in each split to the requirements therein. Special brattices should be used to make the air current sweep the face of each working place. The velocity of the current, at the face, should always be sufficient to sweep away all gases and prevent their accumulation in any void or abandoned places. The velocity in the workings should not exceed 480 ft. per min.

### Correction

The answer to the last question, Pumping Calculation, COAL AGE, Apr. 13, p. 887, made the actual discharge greater than the theoretical discharge, which, of course, is wrong. The answer should read.

(b) Actual discharge,  
 $G = 0.85 \times 705 = \text{say, } 600 \text{ gal. per min.}$



# Coal and Coke News

From Our Own Representatives in Various Important Mining Centers

## Washington, D. C.

The House Committee on Mines and Mining has reported favorably on the Foster bill, which provides for the creation of a Commission of Mining Industry, with power to undertake a general investigation of mining conditions throughout the country. The commission is to be composed of 11 persons, as follows: Two members from the Senate and two from the House, two representatives of the operators, two representatives of the miners, two engineers and a representative of the Bureau of Mines.

It is to be the special duty of this commission to inquire into labor conditions in the mining industry and to seek to discover and point out the underlying causes of dissatisfaction, also to inquire into mining methods with regard to their safety and efficiency, and the general conservation of mineral resources.

## RATES ON COLORADO COAL

A decision by the Interstate Commerce Commission in the case of the Nebraska State Railway Commission vs. the Chicago, Burlington & Quincy R.R. Co. *et al.* explains that in the application of rates on coal from the Walsenburg district of Colorado to numerous points in Nebraska the defendants provide a rate of \$3.50 per net ton to one group of stations and a rate of \$3.75 to a second group. The complainant, in substance, asks that certain points now taking the \$3.75 rate be included within the \$3.50 rate group, and the certain points taking the \$3.50 rate be divided into two new groups to which shall apply rates of \$3 and \$3.25, respectively. The rates involved have been considered, and it is held:

(1) That the defendants subject Minden "K" to undue and unreasonable prejudice in charging a higher rate than applies at Minden, and that for the future the rate to Minden "K" should not exceed the rate contemporaneously maintained to Minden.

(2) That, under the readjustment required by this finding, the rate to Minden "K" should not be exceeded at the intermediate stations of Keene, Wilcox, Ragan, Huntley, Alma, Orleans, Carter, and Sacramento.

The Commission further explains that:

A careful analysis of the reports filed with the Commission by the defendants, the Chicago, Burlington & Quincy R.R. Co., the Colorado & Southern R.R. Co. and the Denver & Rio Grande R.R. Co. shows that the operating expenses per ton-mile over these lines is so high that

we hesitate to make changes in the rates now under investigation other than those noted.

## Alabama

**Birmingham**—The coal operators of Alabama are making an advance in wages, effective May 1, amounting to  $2\frac{1}{2}$ ¢. per ton mine-run for pick mining in the Pratt seam of coal, which is the basing seam for the state. This will advance the Pratt pick-mining rate from  $52\frac{1}{2}$ ¢. per ton to 55¢., and other seams will be advanced in proportion. The yardage and day rates will be advanced about 5 per cent.

Tests have been made recently by Chief Mine Inspector Nesbitt to determine the percentage of gas in the air of several Alabama mines. The apparatus used was that installed here lately by the government. The samples were taken largely from the Flat Top and Indio mines and, in most cases, showed less than one-half of 1 per cent. of explosive gas.

## Colorado

**Denver**—A proposed increase of 35¢. per ton in the freight rates on coal from the Walsenburg district in Colorado to points of destination in Kansas, Oklahoma and Texas, was suspended, Apr. 10, by order of the Interstate Commerce Commission, until Aug. 12. The new rate was to have become effective Apr. 14.

By a recent decision, the Interstate Commerce Commission has ordered a reduction in freight rates on coal from the Walsenburg field to points along the Burlington road as far east as Oxford Junction, Nebraska. A reduction of 25¢. per ton is applicable to the stations of Ragan, Huntley, Wilcox, Sacramento and Minden. The following stations between Minden and Superior must continue to pay the old rate: Superior, Edgar, Clay Center and Harvard.

## Illinois

**Chicago**—The Illinois United Mine Workers have voted to accept an increase of approximately 5¢. per ton of screened coal and to return to work May 1.

**Mount Vernon**—The Chicago Coal Co., of Chicago, has procured options on 3000 acres of coal land in Jefferson County, and it is reported that the purchasers expect to open a number of mines during the present year.

**Coal City**—The head works of mine No. 3, at Tower Hill, were blown over by the storm, Apr. 21, which did great damage in this vicinity.

**Belleville**—One hundred and twenty-eight miners have brought suit against the Royal Coal & Mining Co., the Wilharmil Coal & Coke Co., and R. W. Ropiequet, for \$12,800, wages due them.

**Columbia**—The East St. Louis-Columbia-Waterloo Electric Ry. has obtained a permit to extend its line through East St. Louis, to enter St. Louis over the Eads bridge. The line will extend from East St. Louis to Waterloo, and will tap coal fields that at the present time, have no freight facilities.

**Peoria**—The scale committee and executive board of the Illinois United Mine Workers arranged to meet the Illinois coal operators, including those from the Fifth and Ninth districts, in conference here on Apr. 23. Differences between the miners and operators will be discussed and any agreement which may be reached will be submitted to a referendum vote of the miners of the state.

Articles of incorporation were recently issued to the Mid-Valley Coal Co., which is capitalized at \$80,000, with offices in Peoria. The new company has purchased 500 acres of coal land four miles north of Chillicothe and will begin operations as soon as the suspension of work in the coal mines is over.

**Hillsboro**—It is reported on good authority that the New York Central R.R. has purchased, or is about to purchase, 15,000 acres of coal lands in and around Ohlman. The field is that optioned a few months ago by Harry S. Hargrave, and sold to St. Paul coal-land men. The mining conditions at Ohlman are more like those at Pana than at Hillsboro, and therefore are not quite as good as conditions here. The vein is about  $7\frac{1}{2}$  ft. thick.

## Indiana

**Indianapolis**—The completion of the work of the tellers of the United Mine Workers shows that the bituminous miners have ratified the Cleveland compromise agreement, governing Illinois, Indiana, Ohio and western Pennsylvania, by a vote of 109,709 $\frac{1}{2}$  to 32,139 $\frac{1}{2}$ . Thus 77 per cent. of the 141,849 miners who voted at the referendum balloting, Apr. 10, favored the agreement. Not later than May 1, it is said at the international headquarters, the 240,000 bituminous miners

will be back in the mines. Approximately 150,000 of these are idle at the present time. The formal signing of the contract which is to bind operators and miners in the four-state field until Mar. 31, 1914, is expected to take place this week. In only one district in the country was the majority of votes cast against the agreement. That was in the Kentucky field, where a total of 1220 votes was cast, 566 of these being for and 654 against the agreement. Of the miners in the districts in Pennsylvania, Ohio, Indiana and Illinois, the four states governed by the contract, 82,066 voted for the agreement and 23,300 against it.

**Brazil**—The Crawford Coal Co. has begun the work of sinking a new mine northeast of this city, along the Chicago & Eastern Illinois R.R. When completed it will employ 200 or more miners. This enterprise will prove a big help to Brazil, commercially. The new mine is in the Clay County block-coal field and bids fair to run for many years.

**Bloomington**—Although Monroe County has never been known as a coal producing district, John H. Koontz, who owns a large farm 8 miles west of Bloomington, has found a 4-ft. vein of bituminous coal of excellent quality on his land. It is announced that a company is being formed to develop the find.

**Terre Haute**—The convention of the Indiana United Mine Workers, which adjourned early in March, pending the interstate conference at Cleveland, re-assembled here Apr. 17. The scale committee has prepared a contract to be submitted to the operators at a joint conference. A mutual casualty-insurance agreement will be discussed by both bodies. The operators offered to take up the matter several years ago, but the miners then believed they would succeed in obtaining a state law similar to the one in Illinois.

## Kentucky

**Whitesburg**—The Consolidation Coal Co. has bought 76 acres of coal lands near Jenkins for \$19,700. This is at the rate of a little more than \$250 an acre—perhaps the largest price ever paid for mountain coal lands.

**Louisville**—While a final settlement of the difficulties between the union miners and the operators of western Kentucky has not been reached, the only points at issue now are minor questions in regard to working conditions. The wage scale agreed upon has been submitted to a referendum vote. The union miners of southern Indiana have refused to raise funds to be used in an endeavor to organize the non-union territory of western Kentucky.

The entrance of the Norfolk & Western into the eastern Kentucky coal fields is a

development of interest. It will make the move through the Williamson & Pond Creek R.R., which was recently organized. This road will be built from Williamson, W. Va., along Pond Creek to a point near Elkhorn City, which is the center of the new coal territory now under development. It is largely for this reason that the Norfolk & Western is rebuilding its bridge over the Ohio at Kenova, W. Va., as it expects to handle a large tonnage of coal as soon as its new connection is built. The Carolina, Clinchfield & Ohio is building from Dante, Va., to the Elkhorn field, while the Chesapeake & Ohio is also entering that district.

**Henderson**—The Keystone Mining & Manufacturing Co. has filed a suit against the Louisville & Nashville R.R. Co., in which damages of \$50,000 are asked. The company's claim is that the road failed to furnish it with cars and to quote reasonable rates on the shipment of coal from the mines to the city of Henderson, and that as a result it was found necessary to close down the mines.

**Madisonville**—An explosion of gas in the Coil Co.'s mine near this city, the night of Apr. 21, set the mine on fire and probably caused the death of Joseph Hallowell, a mine foreman, and four negroes. Flames were found issuing from the entry and one of the cages was blown out by the explosion. The mine is a new one, about 200 ft. below the surface and only about half a mile long. Only the five men were in the mine.

**Greenville**—J. W. Lam, Greenville, has purchased the coal mine of the Dovey Coal Co. at Mercer. The purchase price was \$75,000. Mr. Lam is one of the creditors of the company, which is in bankruptcy, with liabilities of \$100,000.

## Missouri

**Kansas City**—A sub-committee of six members, representing the coal operators and the miners, respectively, in the fields of Kansas, Oklahoma, Missouri and Arkansas, began negotiations, Apr. 16, for the writing of a new two-year contract. The conferences were held in the offices of the Central Coal & Coke Co. An early settlement of the differences between the two sides is expected. The miners by a referendum vote have approved the Cleveland agreement, and it only remains now to agree on the contract. The only serious obstacle in writing the contract pertains to the arbitrator in matters of dispute. The miners desire to eliminate this clause and the operators desire to retain it.

**St. Louis**—The freight traffic officials of the various railroads entering St. Louis, have practically decided upon a new coal arbitrary, making the rate on all coal the same to St. Louis as to East St. Louis.

## Ohio

**Zanesville**—Fire broke out, Apr. 18, in the shaft mine No. 302, near Congers, Ohio, in which 400 miners were employed until the suspension of work on Apr. 19. A hundred men at once started to work in an effort to check the flames, and several of the fire fighters were overcome by the fumes.

The announcement was made recently in Columbus, that capitalists of that city have leased 8000 acres of coal lands between Durant and Blue Rock. This is one of the biggest coal deals in the history of this section of the state. It was further announced that the old Stone mine at the mouth of Coal Run will soon be purchased and operated.

**Columbus**—Figures given out from Indianapolis, show that the proposition of remaining at work in accordance with the Cleveland agreement was ratified by the United Mine Workers in western Pennsylvania, Ohio, Indiana and Illinois. The vote against the proposition was unexpectedly large, and hard to account for. The Hocking Valley field is expected to be one of the first to resume operations, as everything is in readiness for resumption. The eastern Ohio field will also resume work soon, and the same is true of the Pomeroy-Bend field. It may be a little time before operations are resumed in the Massillon and Crooksville fields. According to the Cleveland agreement there should be no difficulty in working out the district rulings. The agreement provides that nothing shall be changed to make the cost of mining greater, and, on the other hand, nothing shall be changed to decrease the earnings of the miners.

The Symmes Coal Co., of Ironton, has been ordered by Judge Corn, of the common pleas court of that district, to liquidate claims amounting to \$705,204 within the next 45 days. Failure to comply will result in a sheriff's sale of valuable coal lands, owned by the company in Lawrence and Gallia Counties. Of the indebtedness, \$700,000 is for outstanding bonds and the balance for notes and court costs.

**Bridgeport**—President John Moore, of the Ohio miners, with the subdistrict officials, on Apr. 16, visited the towns of Bradley, Piney Fork and Plum Run, where serious riots occurred recently, when pumpers and other repair men working in the idle mines were assaulted by foreigners.

**Coshocton**—A 5-ft. seam of coal was uncovered recently in the new entry of the Locust Grove Mining Co.'s mine, just south of town. A number of additional men will be employed as soon as the entry is put in shape to start operations.

**St. Clairsville**—It is not believed the mines of eastern Ohio will resume operations before May 1. While the return from Indianapolis announcing the majority in favor of returning to work, will



low the miners to proceed toward making contracts, yet it is believed the operators are not desirous of resuming.

This is due to reports that none of the large consumers is out of coal and also because many of the markets are still overstocked. Should the mines resume at once the operators would be unable to get the normal price for their coal. With the opening of the Lake trade, however, it is expected all the 17,000 miners in the eastern Ohio field will resume work.

## Pennsylvania

### BITUMINOUS

**Pittsburg**—The annual convention of District No. 5, United Mine Workers, broke up in disorder and a "rump" meeting, Apr. 18. The 50,000 idle miners in western Pennsylvania will return to work at once. It was announced that notifications had been sent to the various locals to have the men return to work.

**Dubois**—The joint scale committee of District No. 2, United Mine Workers, after two weeks of deliberation, reached an agreement, Apr. 20. The scale is somewhat lower than the miners demanded, particularly in regard to dead work. It is signed for two years and is as follows: Pick mining per gross ton, 72c.; pick mining per net ton, 64.29c.; machine loading per gross ton, 42c.; machine loading per net ton, 37.23 cents.

**Boswell**—A fire, on the morning of Apr. 12, destroyed the large outside barn at the Merchants' Coal Co.'s mine, and a number of mules were burned to death. The loss, including damage to a nearby dwelling, is estimated at \$3500.

**Charletoi**—In accordance with instructions posted, Apr. 17, nearly all the mines of the Monongahela River Consolidated Coal & Coke Co., the Vesta Coal Co. and various other smaller companies with mines along the Monongahela River, resumed operations Apr. 18. This ended a suspension lasting since Apr. 1.

**Brownsville**—The Knob mine of the Monongahela River Consolidated Coal & Coke Co., idle since Apr. 1, resumed operation, Apr. 19. The Albany and Chamouni mines of the same company resumed work, Apr. 22. About 1500 men are affected.

**Connellsville**—The Connellsville coke field is in the unfortunate position of not being able to supply the demand because of inadequate and uncertain labor conditions. While labor has been coming into the coke region slowly, it has not come in sufficient volume to meet the requirements of the situation. Production for the week ending Apr. 13 fell off 52,175 tons, compared with the week before, the total being 363,289. The decrease was evenly divided between the furnace and merchant ovens, that of the furnace ovens being 26,356 tons, their total being 230,-

732, while the merchant ovens fell off 25,819 tons, their total being 132,913.

### ANTHRACITE

**Scranton**—Following a conference with the board of directors of the Scranton Board of Trade and a committee from the West Scranton Board of Trade, the city council recently received a resolution directing the city solicitor to prepare an ordinance putting into effect the police powers of the city to prevent mine caves. The resolution was referred to a committee and will probably be passed at the regular meeting of council.

A pumpman at the Moosic Mountain colliery, near Jessup, was shot from ambush while on his way to work, Apr. 16. The attack was made near the point where the railroad tracks were dynamited some days ago. This workman had been sticking to his post during the suspension, in accordance with the arrangement between mine workers and operators. It is thought that some of the miners regarded him as a strike breaker.

More than 300 men and women, gathered at the Raymond colliery at the "Ridge," Archbald, at 6 o'clock in the morning of Apr. 20 to enforce the suspension order. When the men began to report for work the crowd chased home every workman except pump-runners, engineers, stable men, firemen and necessary repairmen permitted to work under the suspension order. There was no rioting or lawlessness, the crowd simply asking the workmen to go home and the workmen obeying the request.

**Wilkes-Barre**—The Plymouth Coal Co. has complained to the Interstate Commerce Commission of the rates on anthracite coal in carloads from the Dodson colliery and the Black Diamond colliery and other points on the line of the Pennsylvania R.R., to South Amboy, N. J. The commission was asked to reduce these rates and award reparation to the complainants.

The committee, which is conducting the negotiations between anthracite miners and operators, reconvened in New York, Apr. 16, and has since continued its deliberations in that city. Up to the present writing, no definite news has been given out concerning the progress made by this committee toward reaching an agreement. It is currently reported, however, that the discussion of all questions has been fully and freely entered upon, and that an amicable settlement of present difficulties is expected. As has been anticipated, it is said that the demand of the miners for recognition of their organization forms the chief obstacle in the way of reaching a settlement.

**Mt. Carmel**—A miners' accommodation car on the Reading railroad, near the Philadelphia & Reading Coal & Iron Co.'s Alaska shaft, was blown to pieces, Apr.

17, by dynamiters. A passenger train had passed the siding on which the car lay one minute before the explosion occurred. A detail of coal and iron police are hunting for the dynamiters.

## West Virginia

**Moundsville**—An injunction was granted here, Apr. 16, restraining members of the United Mine Workers from interfering with the operation of the Mound coal mine, where a strike has been in progress for some time, following the refusal of the company to recognize the union. A renewal of the rioting, in which nine men were injured, is anticipated.

**Charleston**—Only about 40 of the 15 mines in the Kanawha district are now working, as a result of the failure of the miners and operators to agree on a wage scale, and between 8500 and 9000 miners are on a strike. The final disagreement came when the operators refused to grant more than the agreement called for last year, while the miners demanded an unlimited check-off.

The mines closed down include all those along the Kanawha & Michigan R.R. in West Virginia. This takes in several thousand miners in Fayette County and a similar number in Kanawha County. Also, all mines are closed along the Chesapeake & Ohio in the Kanawha district, and along the branch lines, with the exception of those on the Cabin Creek branch, and the Coal River extension of the Cabin Creek branch, about 40 in number.

The Kanawha district has about 13,500 miners, so that the number now out represents approximately two-thirds. As far as it has been possible to learn, none of the mines are closed in the New River district nor in the Norfolk & Western district, but it is reported that a number of those in the northern section of the state are shut down.

**Fairmont**—The Consolidation Coal Co. has received an order to ship 50,000 tons of coal to Egypt to be used on the state railways. This is the second such order this company has received recently. The company is still shipping coal to England in spite of the fact that the coal strike there has been declared off. The order for Egypt will be shipped within a short time from Baltimore.

## Washington

**Palouse**—A. E. Sever, president of the Palouse Coal & Oil Co., M. M. Waters, and C. E. Allen, who was engaged during the last winter prospecting on the land of the Palouse Coal & Oil Co., have secured a lease on ground in the vicinity of Glenwood, where indications of the existence of coal seams have recently been found. It is the intention of the lessees to prospect the new fields at once.



## Personals

M. M. Bardwell, general manager of the North Jellico Coal Co., of Louisville, Ky., is at Atlantic City, recuperating from a recent illness.

Robert Lake, of Jackson, Mich., president of the Michigan-Ohio-Indiana Coal Association, was a recent visitor in Columbus, where he called upon a number of coal men.

J. C. Colsom, coal operator and president of the Indiana Operators' Association, is seeking nomination as a candidate for state senator from Vigo County to the next Indiana legislature.

C. W. Adams, vice-president of the St. Paul & Western Coal Co., a subsidiary of the Sunday Creek Coal Co., of Columbus, was recently a caller at the office of the parent company.

C. R. Leake and H. A. Turner, engineers and coal experts of Birmingham, Ala., recently made an examination of the coal-land holdings of the Cullman Coal & Coke Co., at Bremen, Alabama.

Congressman Bowman, of Pittston, Penn., has been elected vice-president of the Roden Coal Co., of Marvel, Ala., of which company his son-in-law, B. F. Roden, is president and general manager.

A. W. Flugel, superintendent of the Island Creek Coal Co.'s docks at Duluth and Superior, recently returned from a trip to Milwaukee and other points, where he inspected various dock properties and equipment.

J. D. O'Neill, president of the United Coal Co., of Pittsburg, Penn., in company with W. S. Kuhn and W. E. Moore, large stockholders in the company, recently made a trip of inspection to the plant of the Merchants Coal Co., at Boswell, Penn., a subsidiary concern.

Chester W. O'Neill, for the past five years general sales agent of the Independent Coal & Coke Co., at Salt Lake City, has been appointed general Western sales agent for the company and will open permanent offices in San Francisco. Mr. O'Neill will be succeeded in the Utah-Idaho-Montana field by William Gorton, who hitherto has been located at the company's mines in Kenilworth, Utah.

Morris H. Bush, general superintendent of the Woodward Iron Co., has succeeded A. H. Woodward as a member of the mine casualty and mining institute committee of the Alabama Coal Operators' Association following the election of Mr. Woodward to the executive committee of the association. Benjamin F. Roden, of Marvel, Ala., has succeeded C. P. Ludwig, general superintendent of the Alabama Consolidated Coal & Coke Co., on the mine-casualty committee, on account of the withdrawal of the Alabama Consolidated Co. from the association.

## Obituary

Edward Avery, aged 78, president of the Avery Coal & Mining Co., with mines in the vicinity of Marissa, Ill., died at his home in St. Louis, Apr. 10.

Charles Clark, a capitalist and one of the founders and directors of the Kansas & Texas Coal Co., died in St. Louis Apr. 18. Mr. Clark was 80 years of age.

George F. Huff, former congressman, banker, coal operator and philanthropist, of Greensburg, Penn., died at his winter residence in Washington, D. C., Apr. 18, after a lingering illness.

Mr. Huff was born July 16, 1842, at Norristown, Penn. He attended the public schools at Norristown until he was 17 years old and then the family moved to Altoona. At the latter place he entered the repair shops of the Pennsylvania R.R. and learned the trade of a car finisher. At the age of 20 years, he entered the banking house of Julian M. Lloyd & Co., Altoona. With his employer he organized a bank at Ebensburg, Cambria County. He was successful, and two years later came to Greensburg and organized a banking house, known as Lloyd, Huff & Co. Later this company was changed to the Greensburg Deposit Bank.

During the years Mr. Huff was engaged in the organization of banking houses he became interested in coal lands. He was president of the Keystone Coal & Coke Co. at the time of his death. The Keystone Coal & Coke Co. is composed of a number of coal companies, all of which originally were organized by Mr. Huff. They are the Greensburg Coal Co., Alexandria Coal Co., Mountain Coal Co., Mutual Mining and Manufacturing Co., Manor Gas & Coal Co., Madison Coal Co., Salem Coal Co., Latrobe Coal Co. and the Carbon Coal Co.

Mr. Huff organized and constructed the Southwest Pennsylvania R.R., which operated lines from Greensburg to the various coal towns in Westmoreland County. He also organized and constructed the Greensburg Electric Street Ry., the Greensburg Electric Light Co. and the Westmoreland Light and Heat Co.

Mr. Huff began his political career in 1881, when he was elected as a national delegate to the Republican convention at Chicago. In 1884 he was elected state senator and in 1888 he was elected Congressman, from the district which consisted of Westmoreland, Indiana, Armstrong and Jefferson counties and was re-elected in 1890 and 1893. In 1894 he was chosen Congressman-at-large. He was elected to Congress again in 1904, 1906 and 1908, and refused the nomination in 1910.

Mr. Huff spent his summers in Greensburg, where he owned an estate of 500 acres, and the winters in Washington. He is survived by his widow and four children.

## Construction News

Brownsville, Penn.—Two hundred coke ovens are being installed at the Allegha mines near here, owned by W. H. Brown, of Pittsburg.

Willmar, Minn.—The Harmon Coal Co., of Chicago, contemplates building here a large coal-storage and distributing plant of 500,000 tons capacity.

Lonaconing, Md.—Louis Stanton, of Frostburg, Md., has purchased the property of the Georges Creek Coal Basin Co. for \$200,000 and will open a new mine.

Crewe, Va.—The Southern Timber Co. is organizing to develop 10,000 acres of coal land and will install equipment for 2000 tons daily capacity; contracts not yet awarded.

Philadelphia, Penn.—The Pennsylvania R.R. Co. will construct a new coal pier at Greenwich Point. Estimated cost, \$200,000. Alexander C. Shand, Philadelphia, is chief engineer.

Philadelphia, Penn.—The Philadelphia & Reading Ry. Co. plans making extensive improvements to its coal pier at Port Richmond. W. Hunter, Philadelphia, is chief engineer.

Burgettstown, Penn.—Smith & Lewis, engineers, Oliver Bldg., Pittsburg, are receiving bids for the erection of buildings for the Atlas Coal Co., Burgettstown; also for piping and other equipment.

Williamsburg, Ky.—The Proctor Coal Co. is opening new mines at Red Ash, in Whitley County, near here, and is purchasing equipment. Charles Finley, Williamsburg, is president and general manager.

Pine Hill, Ky.—The Kentucky Portland Cement & Coal Co., Munsey Bldg., Baltimore, Md., will develop 1200 acres of coal land for daily capacity of 500 tons; cement plant and coal mine equipment to cost \$900,000.

Maben, Ala.—Improvements contemplated by the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., for the Bessie mine, at Maben, include two new boilers, increasing the boiler capacity 400 hp., also one air compressor.

Columbus, Ohio.—The Provident Coal Co. is prepared to let contracts for construction work in connection with opening its new mine at Fairpoint. Contracts will be awarded for grading, laying tracks, mine openings and concrete construction.

Barbourville, Ky.—The Knox Coal Mining Co., of Louisville, Ky., recently incorporated with \$1,000,000 capital stock, will develop 40,000 acres of coal land and will soon be open for bids for mining machinery and plant. Address company at Barbourville.

Coeburn, Va.—H. F. Whitehead, general superintendent, Virginia Iron, Coal & Coke Co., contemplates various improvements at its coal mines, doubling their capacity. It is proposed to equip the mines with new motors, erecting a steel tippie near Sexton and Thelma and to build dwellings.

Harlan, Ky.—Contracts are now being let by the Harlan Coal Co., which is developing a tract of 10,000 acres of coal lands near here. A 5-mile extension to the mines is being built by the Louisville & Nashville Ry. Machinery at the plant will be electrically operated. Kenneth Meguire, of the Snead & Meguire Coal Co., Louisville, Ky., is one of the officers of the company.

# Coal Trade Reviews

Current Prices of Coal and Coke and Market Conditions in the Important Centers

## General Review

Readjustments in market conditions have advanced to a point where the trade is again in an approximately normal condition. Some uncertainty is still felt over the anthracite situation, but it is the general belief that an agreement will be effected at an early date. The continued and apparently harmonious sittings of the wage-scale committees substantiate this belief. Bituminous mines resumed operation under curtailed capacity, Apr. 22, as was expected. Consumers are not in the market for much tonnage, as most large steam users were prepared for a 30-day suspension, and it will be two weeks before production is brought up to normal.

Wholesalers in the East are reluctant to see the market drop back to normal, as many still have considerable high-price speculative coal on hand. Comparatively little fuel is coming forward, but even these small arrivals are difficult to dispose of, as the trade is apathetic with little or no demand at full circular prices. Only about 50 per cent. of the mines in the Pittsburgh district have resumed operations and production will not be up to full rated capacity for two or three weeks. West Virginia mines are supplying what little demand there is in Ohio, the trade there being quiet in every respect. Interest is now centering on the lake trade and coal fleets are preparing to sail.

Supplies in the Middle West have held out well, and the market is heavy and slow. The speculative coal, with which Chicago was swamped a few weeks ago, has been cleaned up, and there is some demand in screenings. The large tonnages, stored on the ground in anticipation of a strike, are being loaded, and a few shipments of Kentucky coals are coming in. There is a perceptible evidence of hesitancy in the trade generally.

## Boston, Mass.

There has been little change in the market this week. Wholesalers are naturally reluctant to drop back, but trade in bituminous is fast settling down to an everyday basis. Cargoes from Hampton Roads are still arriving with high-priced coal and heavy demurrage charges, and in most cases where there are unsold balances they are hard to dispose of. The buyers have little interest in a receding market.

Georges Creek is being freely shipped

but Pennsylvanias are getting heavy. Aside from shipments here and there to relieve those who were unable to get supplies earlier, or more likely to fill orders entered on a "panic" basis there is relatively little coal coming forward, and sales are few. On contract there is some inquiry but apparently it will be difficult to get spirit into the trade until the season is further advanced. The Virginia loading is improving rapidly, and Pocahontas and New River are quoted at near normal prices.

Freights are dull and on tonnage from Hampton Roads individual charters are matters of barter. On Long Island Sound from New York the market is off to the summer basis of 45@50 cents.

Soft coal, all-rail is coming through in large quantities, probably a clearing up of last month's mining. Speculators are having difficulty in placing this coal and since buyers are more fussy about quality than they were a month ago some low prices are heard.

Anthracite seems to be marking time. Large premiums are no longer paid, and a good volume of stock coal, especially in egg and chestnut, is being let into the market. The spring weather makes the retail demand light. Prevailing prices are:

Clearfields, f.o.b. mines.....	\$1.20 @ 1.40
Clearfields, f.o.b. Philadelphia	2.50 @ 2.75
Pocahontas, New River, f.o.b.	
Hampton Roads .....	2.75 @ 2.80

## New York

The extent to which storing was carried on in anticipation of a protracted shut-down at the mines is now becoming evident by the total absence of buyers. Arrivals here so far this month have been much below normal, but there is scarcely any demand, and while prices are fairly strong, there are few transactions.

In bituminous the consumers appear to be heavily stocked, and there are few or no requests for spot coal. The railroad movement is good, water freights easier, and the arrivals steadily improving with the general resumption at the mines. Contrary to reports from West Virginia, the larger companies here say there is no labor shortage at the mines. Ordinary grades of bituminous are quoted at \$2.80 f.o.b., with the better grades bringing \$3.25, but there are few transactions and prices fluctuate rapidly.

It is now evident there will be no resumption at the anthracite mines by May 1, and it is generally believed it will be May 15, and possibly later, before the

mines are again in operation. Work at present is confined entirely to keeping the mines unwatered; some of the larger companies in transferring coal from one colliery to another, created the erroneous rumor that they were again shipping.

There is little activity in the anthracite market at present, but it is believed the supplies are now pretty well exhausted and another week will show a decided tightening of the market. Wholesale anthracite quotations, f.o.b. New York, are as follows:

Egg .....	\$5.00
Stove .....	5.50
Chestnut .....	5.20
Pea .....	3.75
Buckwheat .....	3.25
Rice .....	2.25
Barley .....	2.00

## Philadelphia, Penn.

After almost four weeks of idleness at the mines, the anthracite industry in this city still continues in rather an apathetic condition. All dealers report that what business they are doing comes in one- and two-ton lot orders, and careful inquiry elicits the information that nearly all the dealers are in fairly good condition as regards their supply of the domestic sizes. In fact, many of them have considerably more than they want, when there are rumors that an adjustment of the difficulty between the miners and operators seems to be nearing a conclusion, and they are all hoping that the suspension will continue until they have worked off most if not all of the high-priced coal.

It almost goes without saying that there will be some reduction in prices by the wholesale operators in the event of an early settlement of the present difficulty, but even if they do reduce the prices, it does not necessarily follow that the retailers will do the same; it might be a matter of protection to the dealers to continue present prices until their stocks of winter coal are disposed of. However, no action has as yet been taken by either one or the other, the trade as a unit waiting the final settlement of the labor controversy.

Our previous prediction that mining would not be resumed until the middle of May seems to be confirmed, as any arrangements looking to settlement during the coming week, would hardly become operative until about that time. Very little anthracite coal is coming to this market, just small odds and ends, which some of the little washeries in the



regions are able to turn out, and there is not a particularly good market for it. Dealers are looking askance at coal now at the full circular prices ruling during the winter months, and unless they are in actual need, are not disposed to buy. Steam coals, of which there is little offering, seem to fare better, but the amount is so small that it hardly deserves mention.

### Pittsburg

**Bituminous**—The Cleveland wage scale adjustment was accepted by the miners and arrangements completed for opening the mines Monday, Apr. 22. The opening, however, was far from general, as demand for coal was so light. Large consumers had laid in stocks to carry them fully 30 days, and dealers were also fairly well stocked, so that there has not only been no pressure to obtain coal, but even an absence of the normal current demand. Probably less than one-half the capacity of the Pittsburg district has been put in operation, but production is expected to increase steadily, and to reach normal proportions within two or three weeks.

Shipments in the lake trade will begin nominally May 1, when the reduced rate of 78c., against 88c. last season, goes into effect. They will hardly be large at the start, but the season as a whole is expected to make a new record. As far as can be learned no regular selling has been done in the lake trade.

There is no demand, but producers are naming prices on a basis 7½c. higher than last year's regular or official basis, as follows: Mine-run and nut, \$1.22½; ¾-in., \$1.32½; 1¼-in., \$1.47½; slack, 82½c. These prices constitute the quotable market at the moment, but whether they will hold is another matter. Last year's prices, based on \$1.15, were shaded during the major portion of the season.

**Connellsville Coke**—The market is quiet, but prices are not easier as coke is scarce. We quote: prompt furnace, \$2.60 @ 2.65; prompt foundry, \$3; contract foundry, \$2.65 @ 2.75.

The *Courier* reports production in the Connellsville and lower Connellsville region in the week ending Apr. 13 at 363,289 tons, a drop of 52,000 tons. This was due to celebration of the Easter holidays by the foreign workmen. Some interests in the trade estimate that the actual decrease was larger than shown in the figures quoted, pointing out in addition that the *Courier* figures show very little greater drop in the lower Connellsville region than in the upper, whereas the lower Connellsville labor is almost entirely foreign, and in the upper region a large percentage is American. Shipments were reported at 4210 cars to Pittsburg, 5477 cars to points West and 1346 cars to points East, a total of 11,033 cars, a decrease of 1300 cars.

### Baltimore, Md.

Although some of the larger companies are still doing a fairly active business the majority of the operators report the Baltimore coal market heavy during the past week. The demand was not near as good as in previous weeks, and, of course, prices took a further drop. A careful survey of the situation here shows that operators have, in most instances, not been able to get any better price than they obtained early in January or late last fall.

The general belief in Baltimore is that the coal trade will not show much life again until there is a more decided improvement in the business world. With the large industries running full time, the demand for coal would be increased, and as Baltimore usually holds its own in a competing market, when there is any business to compete for, local operators would probably obtain their share.

There are indications that this improvement in general business conditions will take place. The steel mills, which are large consumers of coal and coke, are operating at a greater capacity, and as steel may be said to reflect the general business condition, it would appear that a gradual improvement in trade is taking place. Operators believe that inquiries for coal will be increased shortly, and that these inquiries will develop into deliveries.

The Consolidation Coal Co. is apparently not suffering any ill effects because of the slow market. During the past week, this well known concern forwarded 5000 tons of fuel to Egypt, for use on Egyptian Railroad. The entire contract closed in this country, calls for a delivery of about 50,000 tons. The Consolidation has numerous large orders on hand, and business is about as active now with this company as it was three or four weeks ago.

The Davis Coal & Coke Co. is now preparing to begin shipments on its contract with the Bethlehem Steel Co., and the first delivery will probably take place some time in June; the contract runs for 20 years. In order to supply the necessary fuel to the Bethlehem company, the Davis company has opened up three additional mines in the vicinity of Thomas, W. Va.

Complaint is still heard of a shortage of miners in West Virginia. It was stated in local coal circles during the week that the operators in that state could easily use 1500 additional men.

### Buffalo, N. Y.

The demand for bituminous coal is light and matters are about as badly unsettled as ever, with very little prospect of any immediate change for the better. The operators are not anxious for an early resumption and are not at all

pleased to find that quite a percentage of the mines in the Pittsburg district are already in operation. There is a good prospect that this new-mined coal will be on the market before there is any demand for it.

There is not much mining in the Allegheny Valley; a great part of the mines closed on the first of April and most of the others shut down on Apr. 15. The miners have been holding meetings in the valley and have issued a long list of demands, but the operators will make no further concessions than were made at the rate meeting at Cleveland last month.

There was to have been a meeting of the Allegheny Valley Operators' Association at East Brady on Apr. 19, but it was postponed. The fact is that if these mines are opened now there will be no market for the product and it is pretty close to that now. For this reason there will be no haste to get the men back to work, though there is no great expectation of saving the trade from the low prices of last year.

Buffalo operators in the tidewater trade claim it would be suicidal to make any further concessions to the miners, for they find the West Virginia product already commanding that market. If the demands of the miners were conceded, it is said that the cost of mining would be increased more than 30c. a ton.

As in recent seasons the Buffalo bituminous market will accept the prices made by the Pittsburgh Coal Co. as a basis, though it may be a hard matter to obtain them sometimes. The prices named, with freight to Buffalo added, are \$2.67½ for Pittsburg select lump, \$2.57½ for three-quarter, \$2.47½ for mine-run and \$2.10 for slack, with Connellsville coke as strong as ever and best foundry advanced to \$5.

The lake fleet is preparing to sail at the end of the week, but it may be delayed by ice. There is soft coal for shipment from Erie and the Ohio ports, but nothing from Buffalo and none to be looked for at present.

There is so little demand for anthracite that dealers are getting a local supply, but shipping agents are receiving no regular amount. It now looks as though the anthracite miners would be idle for some time.

### Cleveland, Ohio

The coal business continues practically at a standstill, because the miners are still out and also because of the large stocks the consumers acquired in anticipation of a strike. There is a little coal coming to Cleveland from the small mines which remained at work after the agreement expired, but this is very hard to dispose of. By the time the mines resume operations and get in full running order, it is hoped the supply will



be nearly exhausted, but nothing heavy is expected until about the first of June, at which time the stocks on hand should be used up, and the large tonnage going up the Lakes will put the market in a normal condition.

It is rumored that a large number of the Pittsburg operators will resume work on Apr. 22, and this coal will come to the Lake ports for shipments north as soon as boats are available. It is generally conceded that a very heavy tonnage will be shipped north this summer. On account of the extreme winter they have exhausted all the supplies on the docks, and will not only have to meet current demands, but will also have to restock the docks, which in the past few years they did not have to do.

### Columbus, Ohio

The coal trade in Ohio during the past week has been quiet in most respects. There is not much demand for tonnage, even when all the mines have been closed down, and what demand there is has been taken care of by jobbers with West Virginia connections. Prices are ruling rather soft, which is difficult to explain, as the amount on hand is not considered very large for this season of the year.

The prospects are bright for a general resumption in all of the Ohio fields by May 1, and possibly there will be some coal mined before then. Operators are taking advantage of the suspension to place their mines in good condition, and they will be in a position to produce a large tonnage from the start.

Consumers of steam grades, who stocked up previous to Apr. 1 in fear of an extended suspension, are not renewing contracts. Many of the consumers seem to prefer taking chances on securing fuel in the open market and probably a number will not make contracts at this time.

The outlook for the future is considered good, and preparations are being made for a renewed activity in every line when the miners resume. The matter of prices is still a question of conjecture, and it is believed that quotations will rule rather low for some time. Prices which seem to prevail in Ohio fields are:

<i>Hocking Valley</i>	
Domestic lump.....	\$1 50
1-in.....	1 35
Nut.....	1 25
Mine-run.....	1 10
Nut, pea and slack.....	0 80
Coarse slack.....	0 70

<i>Pittsburg No. 8</i>	
1-in.....	\$1 20
Mine-run.....	1 05
Coarse slack.....	0 75

<i>Pomeroy Bend</i>	
Domestic lump.....	\$1 55
1-in.....	1 35
Nut.....	1 25
Mine-run.....	1 20
Nut, pea and slack.....	0 80
Coarse slack.....	0 70

<i>Kanawha</i>	
Domestic lump.....	\$1 50
1-in.....	1 35
Mine-run.....	1 10
Slack.....	0 75

### Indianapolis

The present indications are that the miners will not return to work Apr. 22, and possibly not on May 1, pending the final ratification of the wage scale. The operators may ask it, but the men will consent only on certain conditions, which are not likely to be accepted. The operators say they are not in need of coal at present, as the supply in storage is large enough to last until late in May at the present rate of consumption. Two years ago the men asked certain conditions, which were granted, and they worked for two months while a joint committee arranged the details of the final contract. At that time the Illinois miners were idle, and the operators had a large demand for coal from customers of the Illinois operators.

### Chicago

Market conditions in Chicago have been exceedingly slow, buying being quite irregular. There was a slight increase in the demand for screenings, and indications are that all speculative coal has been disposed of.

It is expected that the buying of screenings will come first from the small users and a very fair demand is expected soon. Two of the largest concerns in the Pittsburg district have entered into competition in the Northwest with a cut price, and a sharp scramble for business is already under way. Whether the contract price on smokeless coal will hold throughout the year is a matter of speculation, and depends, dealers say, upon the turn of events in the anthracite field. No new shipments of anthracite are being received and business is dead. The market for coke is fairly steady.

Prevailing prices at Chicago are:

<i>Sullivan County:</i>	
Domestic lump.....	\$2.62@2.87
Egg.....	2.50@2.75
Steam lump.....	2 17
Screenings.....	1.67@1.82

<i>Springfield:</i>	
Domestic lump.....	\$2.57@2.82
Steam lump.....	2 17
Mine-run.....	1.97@2.07
Screenings.....	1.67@1.82

<i>Clinton:</i>	
Domestic lump.....	\$2.52@2.77
Steam lump.....	2 17
Mine-run.....	1.97@2.07
Screenings.....	1.67@1.77

<i>Pocahontas and New River:</i>	
Mine-run.....	\$3 15
Lump and egg.....	4 05

**Coke**—Prices asked for coke are: Connellsville and Wise County, \$4.85; by-product, egg and stove, \$4.95; byproduct, nut, \$4.75; gas-house, \$5.

### Minneapolis—St. Paul

The unanimous opinion of coal men in the Twin Cities is that business in this market has never before been as quiet as at the present writing. Every branch of the coal trade seems to be in a state of

hesitancy as wholesalers are still waiting for prices on which to place contracts and very little coal is coming this way for sale. Some steam users overstocked quite heavily in view of the strike and wholesalers report that a number of them are trying to back out of coal contracted for prior to Apr. 1. This has caused prices to drop considerably as some of these steam users resold coal at big losses and buyers looking for spot coal have had little trouble purchasing at low prices.

The rate case against the coal carriers in Pennsylvania before the Interstate Commerce Commission, having resulted in an order from the Commission reducing the rail rate on Youghiogheny coal from mines to Lake Erie points, 10c. per ton, has been announced in circulars issued by the Dock companies Apr. 15. Youghiogheny lump and nut sizes are quoted at \$3.40 f.o.b. docks or \$4.30 on track Twin Cities; dock run, \$3.10 at docks or \$4 at Twin Cities; Youghiogheny screenings, \$2.40 dock or \$3.30 track Twin Cities. Contracts are being let on Youghiogheny quite freely and wholesalers are anxiously waiting prices on which to base other coals.

The anthracite proposition is not causing very much excitement in this territory as it is generally well along in the summer before stocks arrive and by that time everything will most likely be adjusted. The retailers are the only ones who are uneasy as the consumer in the Northwestern territory has been educated to buy early during the summer and is now inquiring for prices from the retailer.

### St. Louis, Mo.

The coal market in St. Louis is practically at a standstill. There are perhaps a dozen cars a week of Kentucky coal coming in, and the Illinois mines are loading the coal that was dumped on the ground previous to the shut down, whenever there is a demand for any. However, the demand is very small, and all grades of Standard coal have been practically a drug on the market.

There is still some Cartersville coal being offered as low as \$1.40 for lump and egg at the mines, and screenings at \$1. Standard lump has been offered as low as \$1.15 and screenings at 75c. At the present time there is no market in St. Louis for anything in the way of fuels.

### Portland, Ore.

Coal dealers in Portland are having no trouble filling orders as it is the time of year when the demand is light. Cool weather is prevailing at this time, however, and the demand may be strengthened a little should it continue for a couple of weeks.

A topic of much interest here is the question of the policy to be followed in

regard to the coal lands of Alaska, the sentiment here being in favor of throwing them open for development. Cheaper coal here would have a tendency to stimulate many industries, and the establishment of large coal bunkers in Portland harbor is being given serious consideration by the Port of Portland Commission. The arrival of coal from foreign destinations has been very light here since the first of the year.

## Production and Transportation Statistics

### THE CAR SITUATION

The following table shows the surplus and shortages of cars on 169 roads on Apr. 11 last:

	Surplus	Short.	Net Surplus
Box .....	17,616	9,646	7,970
Flat .....	5,684	1,337	4,347
Coal, gond. and hopper .....	48,800	1,222	47,578
Other kinds .....	22,843	3,349	19,494
Total .....	94,943	15,554	79,389

Only section to report a decrease in idle cars was Montana, Wyoming and Nebraska, where a total of only 336 idle cars was reported, compared with 1551 two weeks before. Increased demand for box cars was the cause.

### SOME GOVERNMENT CONTRACTS PENDING

**Washington, D. C.**—Bids are asked by the Paymaster-General, U. S. N., Chief of the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., for furnishing bituminous and semi-bituminous coal, to be delivered in such quantities and at such times as may be required during the fiscal year ending June 30, 1913. The coal is to be 2240 lb. to the ton, and is to have an analysis indicating quality not lower than the following:

Moisture, "delivered coal," 3 per cent.; ash, "dry coal," 10 per cent.; volatile matter, "dry coal," 22 per cent.; sulphur, "dry coal," 1 $\frac{3}{4}$  per cent.; "B. t.u.," "dry coal," not less than 14,200 per pound.

Schedule 4492, opening 10 a.m., May 14:

**Class 1**, 1300 tons bituminous coal, for delivery at the naval powder depot, Lake Denmark, Morris County, N. J.

**Class 2**, for delivery at Navy Yard, Philadelphia, Penn., 18,000 tons semi-bituminous coal.

**Class 3**, for delivery at the Naval Academy, Annapolis, Md., 12,000 tons bituminous coal for steaming purposes.

**Class 4**, for delivery at the Naval Engineering Experiment Station, near Annapolis, Md., 1500 tons bituminous coal.

**Class 5**, for delivery at the Naval Hospital, Washington, D. C., 2500 tons semi-bituminous coal, best quality.

**Class 6**, for delivery at the Navy Yard, Washington, D. C., 30,000 tons bituminous coal, to be standard grade New River, Pocahontas or Georges Creek coal, and to be crushed so that it will pass through a ring two inches in diameter.

**Class 7**, to be delivered at the Navy Yard, Norfolk, Va., 15,000 tons, semi-bituminous coal.

**Class 8**, to be delivered at the Naval Hospital, Norfolk, Va., 2500 tons semi-bituminous coal, best quality.

**Class 9**, to be delivered at the Naval Training Station, North Chicago, Ill., 13,500 tons bituminous coal.

Bidders are required to state: The commercial name of the coal, name of mine or mines, location of mine or mines, name or other designation of the coal bed or beds, British thermal units per pound, percentage of sulphur in "dry coal," percentage of ash in "dry coal," percentage of volatile matter in "dry coal," moisture in coal as received, and to furnish samples for test.

### OHIO COAL TRAFFIC STATEMENT

Comparative statement of bituminous shipments over the principal Ohio railroads, for February, 1911-12, in short tons:

	1911	1912
Hocking Valley .....	238,060	417,176
Toledo & Ohio Central .....	85,282	165,118
Baltimore & Ohio .....	128,611	244,409
Wheeling & Lake Erie .....	231,328	409,966
Cleveland, Lorain & Wheeling .....	147,549	298,896
Zanesville & Western .....	94,309	121,410
Toledo Division, Pennsylvania Co. .....	153,504	561,675
Lake Erie, Alliance & Wheeling .....	99,425	141,643
Marietta, Columbus & Cleveland .....	1,403	13,942
Wabash Pittsburgh Terminal .....	7,160	4,432
Kanawha & Michigan .....	10,066	20,260
Total .....	1,196,697	2,398,927

### WATER SHIPMENTS TO CALIFORNIA

The following is a comparative statement of water shipments of coal and coke to California during the last three years in long tons:

Coal	1909	1910	1911
British Columbia .....	188,125	157,489	207,203
Australia .....	68,086	115,179	198,730
Great Britain .....	3,105	.....	2,639
China .....	.....	.....	6,170
Japan .....	546	38,817	279
Oregon .....	24,125	25,203	7,439
Washington .....	16,940	50,342	57,298
Eastern .....	69,696	101,265	80,338
Total .....	370,623	486,385	560,096
Coke			
Great Britain .....	59,804	57,496	87,296
Australia .....	14,955	14,442	3,725
Washington .....	.....	.....	.....
Japan .....	.....	2,500	2,795
Total .....	74,759	74,438	93,816

## Foreign Markets

The following is a comparative statement of the British fuel exports for the first three months of 1911-12, in tons:

	1911	1912
Anthracite .....	597,551	558,004
Steam .....	11,051,747	9,046,223
Gas .....	2,442,009	1,938,998
Household .....	368,444	299,234
Other sorts .....	738,601	630,613
Coke .....	251,671	277,123
Patented fuel .....	425,246	373,332
Bunker coal .....	4,701,509	4,051,302
Totals .....	20,579,778	17,174,829

### BRITISH COLUMBIA

In the East Kootenai district of British Columbia there was a falling off during the year of 1911 of 605,000 tons of coal and 40,000 tons of coke as compared with the production in 1910, and the total coal shortage for the whole province was 365,000 tons. Much loss was sustained by the various mineral smelters, due to the coal strike, and the shutting off of the coke supply.

### DUTCH IMPORTS AND EXPORTS

The imports of coal into Dutch ports during 1911 showed an increase over the previous year's figures to the extent of nearly one million tons, the total being 11,344,981 tons, as against 10,347,138 tons. In 1910 a similar increase over 1909 was recorded. The exports last year amounted to 4,330,282 tons, showing an increase of 314,353 tons over the 4,015,929 tons exported in 1910.

## Financial Notes

The New York Stock Exchange has listed \$960,000 additional first and second, 40-year, 5% bonds of the Consolidation Coal Co., due 1950, making the total amount listed \$13,960,000. New bonds are issued for additions and improvements.

The Delaware & Hudson Co.'s stock and bond holdings increased from \$23,967,687 in 1910 to \$27,014,189 at the close of 1911. The gain was almost wholly accounted for by the increase in Hudson Coal stock from \$100,000 to \$2,500,000. This served to settle the account owed by the coal company to the railroad company. The change in bonds held by the company's treasury was under \$500,000.

Annual report of the International Coal and Coke Co. shows disbursements for last year as follows: Dividends, \$56,073.38; maintenance, \$77,554.28, and improvements, \$47,029.61. The company is capitalized at \$3,000,000 and owns mines in Alberta, British Columbia. Operations were suspended during eight months of last year because of strikes. It is believed the company will make a better showing during the current year.

United States District Court for northern district of Ohio, in the case of protective committee for Pittsburgh, Wheeling & Lake Erie Coal Co. 4% bondholders vs. Wheeling & Lake Erie Railroad Co. and others, held railroad company is obliged to pay off \$200,000 prior lien obligations of coal company. Decision established that where corporation is organized and managed simply as adjunct to another corporation, principal corporation is liable for debts of subsidiary.

Chairman Taylor, of the Pittsburgh Coal Co., gives the following details of the deals with the H. C. Frick Coke Co. and the stockholders of the Monongahela River C. C. & C. Co.: The company sold about 7000 acres of coking coal land, with improvements, at \$1450 per acre to the Frick company. The final settlement will bring the proceeds up about \$10,000,000. A payment of \$9,561,000 has been made in H. C. Frick Coke bonds, which were sold at par, less 1 per cent. commission, and with the proceeds \$8,600,000 Pittsburgh Coal bonds were purchased at 110 and interest.